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Development of Medical Care Plans for Low Income Farm Families*

Three Years Experience

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THE program under which more than 100,000 low-income farm families, borrowers from the Farm Security Administration, are at present obtaining medical care, grew out of an economic necessity. It has appeared as an incidental by-product of a depression-born program of farm loans which were made exclusively to families unable to obtain credit from any non-governmental source. It is designed to accommodate a very special economic group only. It is governmental only in that its organization is sponsored and its operations are partly financed—through loans to its debtor families to enable participation by a governmental credit agency which has loaned several hundred million dollars with little security except the character and productive ability of families receiving medical aid under the arrangements.

Its background explains much of its organization and method.

Five years ago, three million farm families were on the brink of disaster. Flood and drought had played havoc with crops. The depression brought economic chaos to an already unstable farm economy. Credit had vanished; crops were selling at low prices. It was a period of foreclosures and "penny" auctions. The wholesale migration of farm families from one farm area to another seeking an opportunity for livelihood became a common phenomenon.

For roughly one-fourth of the farm population, relief was the only means of living until the Farm Security Administration offered to make small loans to enable farmers to continue planting their crops.

The Farm Security Administration makes these loans, repayable within 5 years at 3 per cent, so that farmers may buy the feed, seed, and tools necessary for the year's operations. Often the loans must help the farmer to meet the expenses of clothing and feeding his family until he makes a crop.

Before a farmer can receive a loan he fulfils the following requirements:

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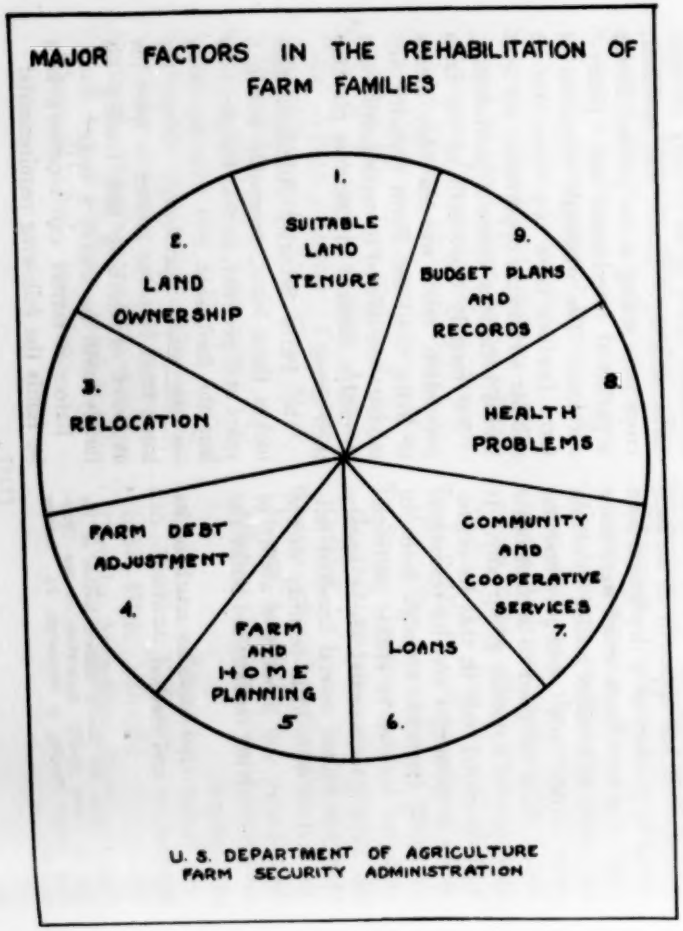
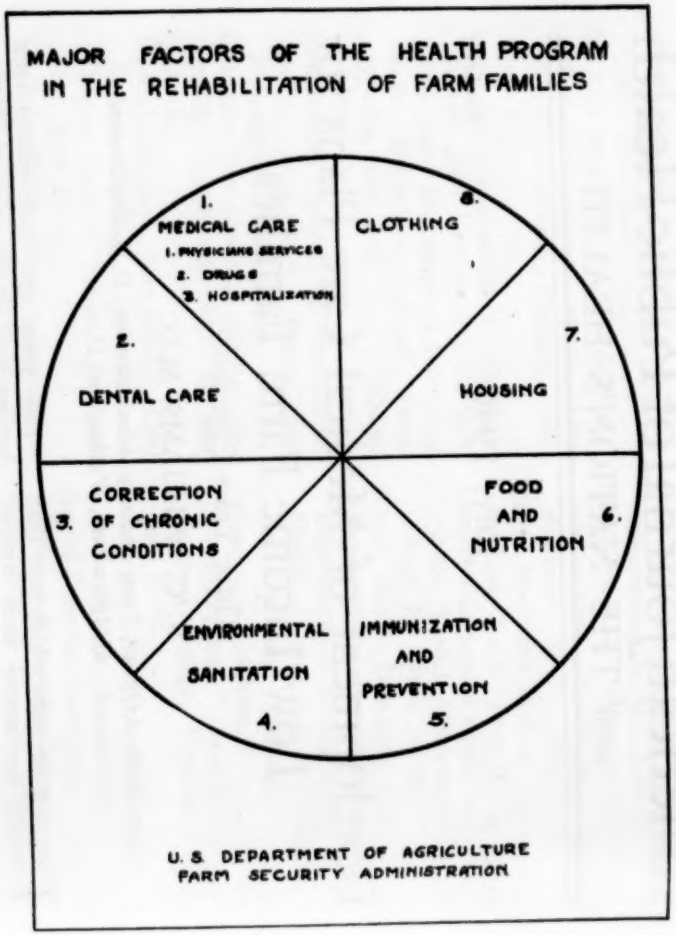

MAJOR FACTORS IN THE REHABILITATION OF FARM FAMILIES
1. SUITABLE LAND TENURE
2. LAND OWNERSHIP
3. RELOCATION
4. FARM DEBT ADJUSTMENT
5. FARM AND HOME PLANNING
6. LOANS
7. COMMUNITY AND COOPERATIVE SERVICES
8. HEALTH PROBLEMS
9. BUDGET PLANS AND RECORDS
U. S. DEPARTMENT OF AGRICULTURE
FARM SECURITY ADMINISTRATION


MAJOR FACTORS OF THE HEALTH PROGRAM IN THE REHABILITATION OF FARM FAMILIES
1. MEDICAL CARE
1. PHYSICIANS SERVICES
2. DRUGS
3. HOSPITALIZATION
2. DENTAL CARE
3. CORRECTION OF CHRONIC CONDITIONS
4. ENVIRONMENTAL SANITATION
5. IMMUNIZATION AND PREVENTION
6. FOOD AND NUTRITION
7. HOUSING
8. CLOTHING
U. S. DEPARTMENT OF AGRICULTURE
FARM SECURITY ADMINISTRATION

1. He must be unable to obtain either funds or satisfactory credit from any other source, public or private.
2. He must know how to run a farm or have derived the major part of his income for the previous six months from farming operations.
3. He must be approved for the loan by a local county committee, generally composed of two or three farmers and one or two business men who can attest character and ability.
4. He must be able to do the farm work.
5. He must be renting a farm or have an equity in a farm.

All loans are based on adequate guidance of the family during the period in which they are trying to reëstablish themselves. The purpose of loans and guidance is to make the families again self-supporting and self-reliant. The major factors given emphasis in undertaking to aid the rehabilitation of a family are: suitable land tenure, adequate equipment, adjustment of any over-burdening previous debts, sound planning of farm and home management, use of community and coöperative services to supplement family equipment, adequate financing at reasonable rates of interest, careful budgeting and record keeping. Farm Security Administration supervisors work with the farmer until the loan is repaid, helping him to plan his farm enterprise and advising him on more effective methods of raising crops or conserving the soil. Home management supervisors periodically visit the farm wives and advise them on their problems of canning, raising garden produce, sewing, and other work of the homemaker involving the success of the family enterprise.

LOANS DEFAULTED

It was through these county supervisors, who are constantly in touch with borrower families, that the first inklings of a serious gap in the program's early efforts were called to the attention of administrators. Difficulty in working with some of the families was traced to lack of medical attention—to acute illness, abscessed teeth, hernias, malaria, and other conditions. It was reported that loans were defaulted as chickens, hogs, or calves were sold to pay for medical bills. When families had no money to pay for physicians' services, avoidable deaths occurred and the government lost the money it had invested.

An investigation of a sample of Farm Security Administration borrowers who had failed revealed that 50 per cent of the "failure" cases were directly traceable to "bad health." Aside from the wanton waste of human life and curtailment of borrowers' usefulness to themselves, some kind of medical care program was plainly indicated to the Farm Security Administration from a purely economic point of view by the findings of this survey.

The basis of the medical care program is a conviction that a family in good health is a better credit risk than a family in bad health. Economic security depends to a large extent on health security.

The Farm Security Administration loan program was in jeopardy until some feasible plan for getting medical aid for its farmers could be found.

THE MEDICALLY INDIGENT

Once the need was recognized, the next step was to get medical aid to needy borrower families who could not obtain it through regular channels. There was no organized system of providing medical care for medically indigent rural families in most of the states. In a few states, the families had to be certified as paupers before any medical aid was given. In one state, a "Black List" of patients who had not paid their doctor bills prevented physicians from attending indigent cases on pain of expulsion from the local medical society. Nothing could be done for these families without the help and understanding of the medical profession.

The gap between the families needing medical attention and the physicians who could render it was not simple to bridge.

Due to the cost and delay involved in making a loan, and the additional difficulties of auditing and individually justifying expenditures for medical care by borrowers, it was not feasible for the Farm Security Administration to make small supplemental loans to its borrowers to help them meet medical care bills as they were presented. A single loan to each family at the beginning of the year to cover medical care for the 12 months was precarious. The incidence of disease among individuals is not exactly predictable; and it was certain that in some instances where serious illnesses developed, any probable sum set aside would be inadequate to cover costs for the family stricken; either the bill would go unpaid or the family would be bankrupted, the loan advanced by the Farm Security Administration defaulted, and the work of rehabilitation left to begin again. In other instances, the sum loaned for medical care would be too much.

In order to avoid the occasional family financial disasters and the defaulting of medical care bills which the loans were intended to forestall, it seemed necessary to persuade borrowers to pool the funds loaned to each for medical care at the beginning of the year, so as to give each family assurance of all needed care as well as to keep medical costs within their ability to pay. Finally, it was necessary that physicians, assured that each of these near-relief families was paying according to its ability into the pool, should accept as payment for services that proportion of their regular fees which funds in the pool would cover.

When a medical care program was started in 1936, however, the principle of prepayment for medical services had not yet been accepted by the medical profession. And while insurance for protection against loss of life, threat of fire or theft were old stories to the American public, the banding together of a group of people for mutual protection against the incidence of illness was new to the public and viewed with misgivings.

The families which had borrowed from Farm Security Administration had learned the rudimentary lessons of coöperation for their everyday needs by buying plows, livestock for breeding purposes, or canning equipment in groups for the use of all participants. This form of coöperation, however, showed immediate results in the use of the purchased article. Paying a flat sum for medical care was somewhat of a risk. You might be sick this year, and then again you might not. It was a higher type of coöperation that these families would have to accept voluntarily.

On the other hand, two facts argued the feasibility of the plan: (1) these farm families realized they had desperate need for such a service and wanted it, and (2) physicians—especially rural physicians—were anxious to readjust a system of compensation which left them after a period of years with thousands of dollars worth of unpaid bills on hand.

The only feasible approach to the problem, at any rate, seemed to be the grouping of families under a plan, paying a flat fee per year for medical care, and the participation of physicians who would agree to treat these families at a uniform fee schedule which would take into account the families' low income.

State medical associations were approached with tentative outlines for medical care plans. The plans were framed so that existing local facilities would be used in every case, and that participation fees would be based on the ability of the family to pay—a principle long recognized and put into

practice by the medical profession. Not all state medical associations have yet been approached—the present program only started in the spring of 1937—but already 26 state medical associations have approved medical care plans.

In some states, the state medical association welcomed the opportunity of trying out an experiment which was obviously necessary and about which they had long wondered. Other state medical associations accepted the plan on sufferance with the understanding that it was purely on a trial basis.

THE PLANS

A great variety of plans has been initiated, but, in general, they follow three patterns. In most of the plans, borrower families pool their funds and put them in charge of a trustee.* The trustee then pay all physicians' bills for the group as fully as funds will allow, on a monthly, pro rata basis. Under another plan which is gradually being discontinued, funds for each family are placed in the hands of a trustee, but separate accounts are kept for each family. The third kind of plan provides that an association of Farm Security families—grouped together on projects—may employ one or more physicians on a salary basis to provide necessary medical aid.

Meetings with the economic committee or council of the state medical association are usually held, at which a memorandum of understanding or a guide to be used as a basis for developing local health service associations within the state is worked out. These memoranda of understanding are prepared by the officials of the state medical associations, with the assistance of officials of the Farm Security Administration. The usual policy of the state associations has been to refer the memorandum back to the house of delegates of the state medical association for final endorsement. In some states, simple resolutions were adopted by the house of delegates referring this matter back to the local medical societies to be worked out, without specific recommendations. Based on these memoranda or resolutions, agreements are then worked out with local medical societies.

The basic procedure in each case, however, is the same, although state and county differences are apparent in most plans. Before any medical care plan is set up for Farm Security Administration borrowers, county supervisors — the people who are directly in contact with the families—are asked if there is a need for a medical program revealed in the current farm and home plans of the family. If there is a need and a desire on the part of the families to participate in such a plan, representatives of the Farm Security Administration charged with the responsibility of carrying out the program approach the local medical society. A common understanding of the benefits that should be included in the medical program and a reasonable family fee, based on income indicated in the farm and home plans, is reached before the matter is laid before the families.

The agreements with the county societies recognize the three basic principles of the medical program: (1) the participation fee for borrower families is based on their ability to pay as determined by their farm plans; (2) there is free choice of physicians who agree to participate; (3) funds are set aside in the hands of a bonded trustee at the *beginning* of the operating period.

The medical benefits covered in the

* When a family borrowing from the Farm Security Administration lacks funds at the beginning of the year to make its payment into the fund, the Farm Security Administration will increase the amount of the general loan for rehabilitation by the sum necessary to permit its participation. No separate loan for medical purposes is made; participation in the medical care program is regarded as quite as necessary to sound farming as is adequate workstock, and no distinction between moneys for the two purposes is made either in loaning or collection processes.

plan usually include: (a) ordinary medical care, including examination, diagnosis, and treatment in the home of the family or in the office of the physician; (b) emergency surgery necessary to save the life or limb of the individual as determined by the physician in charge of the case; (c) emergency hospitalization believed necessary and recommended by the attending physician; (d) obstetrical care, including prenatal, delivery, and postnatal care services; (e) ordinary drugs dispensed or prescribed by attending physician; (f) in some areas, dentistry prescribed by attending physician and believed necessary to relieve acute systemic diseases or to relieve pain.

PAYMENT FOR SERVICES

For these services the family under the most typical agreement usually pays from $15 to $30 a year. The amount paid varies according to benefits included under the plan, according to size of average farm incomes in the locality, and according to size of family. A typical payment schedule for physician's care in a low-income county might be an annual $18 for man and wife with an additional $1 for each child up to 8, with a maximum payment of $26 per family. The money is pooled and a certain amount is allocated for hospitalization and emergency needs, including surgical care, at the beginning of each period. The remaining fund is then divided into equal monthly allotments for the period covered.

Physicians submit monthly statements based on a fixed fee schedule to the trustee for services rendered. These bills are reviewed by a committee from the local medical society. If the total bills for a given month exceed the amount available, all bills are proportionately reduced and each physician paid his pro rata share of the month's allotment. If the allotted funds for the month are sufficient, the bills are paid in full; if a balance remains, it is carried forward to the next month or to the end of the period, and then used to complete paying bills for months in which funds were not adequate.

The pool plans vary as to organization. While under many of the county pool medical care plans the farmer-participants are formally organized into unincorporated associations; others are informal groups with the trustee responsible for funds and the reviewing committee of physicians responsible for checking the bills.

Benefits included under the medical care plans also vary according to the participation fee and local needs. The percentage of money set aside from the total funds for hospitalization, drugs, and physicians' services are worked out with the local county medical societies. The majority of county pool plans cover emergency medical care, including obstetrics and hospitalization. Forward looking counties have also added dental services, while a few plans provide only for emergency medical care. In one state, 40 counties have plans for dental care which are operated on a separate basis. For $3.50 a year for each family and $.50 in addition for each person in the family the participating family obtains emergency treatment, simple fillings, extractions, prophylaxis, and cleaning.

Drugs are sometimes a problem under the plans. Unless druggists coöperate* with the program, it is found that an unusually high percentage of the funds —sometimes as much as 35 per cent— must go to pay the standard price of drugs; from 7 per cent to 12 per cent is more nearly normal. In a number of plans, however, physicians dispense the drugs they prescribe or have the prescriptions charged to themselves. The most ideal solution, of course, would be to have the borrower families

* By accepting pro-ration of bills along with physicians or giving a fixed discount.

pay for the drugs they might need aside from the plan. It was found, however, that because these families have such a low cash income, they were not in a position to pay for drugs and often the families could not have the physician's prescriptions filled.

In all county pool plans, there is a set fee schedule for the physicians serving the families. The individual contract plan works on an entirely different basis. Funds for each family participating are set aside and the physician of the family's choice agrees to render medical service for a certain sum a year. If the family has no illness that year, the money is refunded or applied to the next year's account. If the family needs more services than are covered by the fee it has paid, the physician continues his services free of charge during the remainder of the period.*

POOLING OF INDIVIDUAL FEES

Experiences with the two plans clearly indicate that for low-income families the first plan is preferable, that is, a plan providing for pooling of the individual fees into one general fund. In Ohio and Missouri, where the individual contract plan is in effect, results have not been wholly satisfactory and the plan may be dropped within a few months. The plan is hard on the physician when a protracted illness develops and, too often, families will not see the physician in order to save the money they have set aside for medical purposes.† Nor does the plan distribute the cost over many families, so that the cost of severe illness to one family can be more nearly equalized. In Missouri, the State Economics Committee of the Medical Association has agreed to try out a medical care plan on a pool basis in a few counties to study its merits.

County or district plans for medical care are operating as of September 30, 1939, in 21 counties in Alabama, 68 in Arkansas, 4 in Colorado, 5 in Florida, 108 in Georgia, 5 in Indiana, 1 in Idaho, 3 in Iowa, 35 in Kansas, 7 in Louisiana, 41 in Mississippi, 12 in Missouri, 1 in New Jersey, 7 in New Mexico, 11 in North Carolina, 11 in Ohio, 11 in Oklahoma, 17 in South Carolina, 7 in Tennessee, 43 in Texas, 1 in Utah, 19 in Virginia, and 3 in Wyoming. The swift extension of the program during the last two years is indicated by the increase in the number of county plans operating in Georgia where we had 5 counties participating last year and 108 counties this year.

Agreements with the state medical associations prior to approaching county medical societies have been reached with Wisconsin, Wyoming, Kentucky, Pennsylvania, New Hampshire, West Virginia, Vermont, New York, and Washington.

There is a somewhat different approach to the problem of medical care in homestead projects established by the Farm Security Administration. In most of these communities, from 100 to 200 families have settled on adjoining farms. When these projects are located some distance from cities, the problem of medical care for the homesteaders is often an acute one. In a few instances, they have employed a physician living nearby on a part-time basis. Occasionally, it has been necessary to attract a resident physician to the project by setting up a program providing a basic guaranteed income. In most cases, however, the services of all nearby physicians are utilized. Medical care programs have been organized in

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* The Farm Security Administration through its local supervisors keeps in touch with the working of the plans where they are set up, but has no authority over them—loans are to the individuals to enable participation, not to the group or association organized to obtain medical aid.

† A collateral function of the prepayment feature of the plans is that of encouraging acceptance of preventive medicine by the participants. Too often low-income families in the past have habitually waited until illness became serious to the point of debilitation of the patient before obtaining medical aid.

30 projects, and programs are now being set up on 8 other projects.

In several communities the homesteaders have themselves organized voluntary beneficial associations which have worked out special agreements with physicians and hospitals. In some instances the families pay regular membership dues in cash, without help from the Farm Security Administration. In certain other projects the Farm Security Administration lends money to the homesteaders for this purpose, and these loans are later repaid when the crops are sold. A wide variety of arrangements for medical care are in effect in these community projects.

A few facts regarding a typical project program will illustrate how the medical care needs of the homesteaders are being met. Every one of the 141 families on this project became a member of the health association, paying in advance $18 per family for general practitioner care for one year. All five physicians living nearby participated, agreeing upon a uniform fee schedule which represented a moderate reduction in their usual fees. An average of 83.5 per cent payment was made on medical bills throughout the first year, the monthly payments ranging from 64.5 to 100 per cent. Of the families in the association, 96 per cent had one or more of their members receiving service during the year, and 47 per cent of the families received service for which the charges exceeded the $18 membership fee.

SPECIAL TYPES OF PROGRAM

Distinct from the general program of medical care is the program set up in North and South Dakota and in California and Arizona. These four states had local problems which made necessary a completely different type of plan. North and South Dakota had been seriously affected by the drought; California and Arizona experienced an influx of migrants living in highly unsanitary conditions who were a potential threat to the health of nearby communities.

North and South Dakota first tried a medical care program in 1936. In these two states alone, about 55,000 families were participating in a state-wide medical plan by November 1, 1938. By paying $2 a month per family for a minimum period of 6 months, families became members of the North Dakota Farmers' Mutual Aid Corporation or the South Dakota Farmers' Aid Corporation. Through these corporations they were entitled to emergency medical care, emergency dental care, emergency hospitalization, prescribed drugs and home nursing. The family had the free choice of any physician licensed to practise medicine in the state. The charges made for medical service were based on a special schedule of fees agreed to by participating physicians and other professions concerned. Bills were paid monthly and prorated if funds did not cover the full amount of the bills.

With the advent of the more general program of medical care and the experience gained from it, certain flaws were noted in the Dakota plans. Both families and physicians seemed discontented —the families maintaining that they did not receive enough services, the physicians stating that they did not receive adequate compensation for services rendered. In South Dakota, there was the additional factor that practitioners other than legally qualified doctors of medicine were seeking to participate in the medical care plan.

The uncertainty of whether funds necessary to continue the program would be appropriated by Congress caused additional uneasiness about the plans. The program was declared inoperative as of July 1, 1939, pending reorganization.

At present, North Dakota has no medical care plan, but an outline of proposed action has been drawn up.

It includes a payment of $33 per family per year to include emergency medical and dental care as well as emergency hospitalization and prescribed drugs. A higher fee was set to avoid the past experience of having insufficient funds.

A further change proposed was that the medical care program be set up on a unit basis, utilizing one or more counties as local conditions seemed to indicate, and that funds paid into the plan by the families residing in a given area be kept separate for that area, thus leaving in the hands of the families and professional groups in the district virtual control of the plan. In effect, the proposal as it stands would put into operation in North Dakota local medical care plans similar to those existing in other states. The actual operation of the plan is pending its acceptance by the physicians of the state.

In South Dakota, a district plan is being set up on a trial basis at Pierre. This unit will provide medical care for Farm Security Administration families in the several counties in that area. There is a potential case load in this area of approximately 2,500 families or 12,500 persons, with 13 physicians, 8 dentists, and 2 hospitals. Funds will be loaned to these families for participation on the basis of $33 a year per family, which will provide emergency medical and dental care, hospitalization and prescribed drugs.

The unit was set up in order to test the legality of a ruling recently issued in South Dakota. At a recent session of the South Dakota legislature, a Bill was enacted which purports to require that all practitioners of the healing art participate in any public health and medical care program that is conducted in South Dakota. The Bill might compel the South Dakota Farmers' Aid Corporation to utilize the services of osteopaths, chiropractors, and other similar practitioners, and thus alienate the medical profession from the program. The Attorney General of South Dakota has given a written opinion to the effect that this Act of the Legislature applies only to funds appropriated by the State of South Dakota. The matter cannot be finally decided until it is passed upon by the proper courts.

In order to pave the way for such action, the single medical care unit was set up at Pierre. Should the osteopaths and chiropractors wish to make a test case of the matter, they may proceed to get out an injunction and the matter would be given final determination by the courts. No further units will be established in South Dakota until this legal question has been settled. The decision will affect approximately 22,000 families in South Dakota who are receiving aid from the Farm Security Administration.

In California and Arizona, a different type of medical care program was undertaken, to meet the needs of migratory agricultural workers who required medical attention, but rarely could afford to pay for such aid.

The influx of migrants into California and Arizona since 1935 has created a serious public health problem in these two states. Most of them have a low and uncertain income, live in roadside "jungles," patched tents or hastily improvised shelters with no sanitary facilities.

The constant movement of migrants from one farming area to another, sometimes more than 300 miles away, contributed to the rapid spread of communicable diseases. Despite the vigilance of the California State Department of Health, outbreaks of smallpox or typhoid in widely separated counties remained a potential threat.

In May, 1938, the Farm Security Administration, with the coöperation of the California Medical Association, the State Department of Health, and the State Relief Administration, formed the Agricultural Workers' Health and Medi-

cal Association, incorporated under state laws. Each of the agencies has a representative on the Board of Directors of this non-profit corporation.

Migrants make applications for medical treatment at the association's district offices or camp treatment centers. A certificate of membership in the health association, which serves as an identification card, is issued to the applicant.

He then selects his physician from a list of participating physicians or is treated by the local part-time physician in charge of the treatment center. The Agricultural Workers' Health and Medical Association is billed for the medical services or hospital services rendered. In many treatment centers, local physicians work in the clinics at designated hours on alternate days. The personnel of the typical treatment centers consists of a part-time physician, a nurse, and a clerk. Services include ordinary medical and surgical care, laboratory examinations, x-ray, dentistry, prescriptions, and treatment as required.

Although the migrant workers are obligated to repay the cost of services "if so requested" their economic status precludes any expectation of repayments in most cases. Some workers, however, have been able to repay a few dollars. In view of the savings effected in the health of the two states under this program, it seems probable that adequate financial support will continue. Similar conditions prevailed in Arizona, and similar measures were undertaken.

There are, at present, 13 medical care centers in California and 6 in Arizona.

DIFFICULTIES ENCOUNTERED

Appraisal of the medical care program is difficult. There are many pitfalls that have been avoided and yet there are bound to be difficulties in a program which affects so many people in widely diverse areas. The human element cannot be overlooked. No matter how perfect a plan is theoretically, when put into practice it must deal with actualities. There has been a certain amount of abuse of the program by both the physicians and the families. Physicians sometimes present bills for previous services to these families; submit bills for families not on the program; or charge a higher fee for rehabilitation borrowers than for other patients on the same economic level. Families sometimes use a number of physicians during the month; request service for chronic ailments, or request unnecessary services. These difficulties were to be expected and mechanisms are being developed to control them.

Each participating physician gets a list of participating Farm Security families in his county and each family on the program gets a list of coöperating physicians. The health participation agreement which the family signs sets forth the medical benefits to which they are entitled. Physicians keep individual records of each family visited. In some areas participating families make monthly reports on health services they receive. In addition to this, a reviewing committee, drawn from the physicians' ranks, is set up under each plan to go over bills. This committee can adjust bills when necessary. A strong reviewing committee limits abuses by the physicians. The county supervisor acts in a like capacity for the families, checking on the number of unusual demands for services made by families. Usually, if the family is abusing the program the matter can be adjusted satisfactorily, otherwise the family is dropped from the program.

The attitude of both the physicians and families toward the medical care program is, on the whole, favorable. Monthly payments to physicians have ranged from 40 to 100 per cent. Payments under the plans average, the country over, approximately 60 per cent of total bills presented. One physician remarked that he was glad to get that

much of his collections, since in other cases he had not collected so much. From another county in a southern state comes the report, "The doctors would like 100 per cent payment, but they admit that 74 per cent is better payment than they usually collect from their rural practice. Some doctors have admitted that they were opposed to the project until they served on reviewing committees or otherwise saw more of the aim of the program."

The heart of the program lies in a clear understanding on the part of physicians and families as to what can be expected under the program, and its limitations. It is essentially a special program for an under-privileged group of farm people. The plan could not be transferred to any other segment of the population without some change. A more solvent group of people would demand an extended and fuller program of medical care. But for the group of people for whom the program is giving new opportunities and aid in efforts to get back on their feet, the plan is a boon. Due to the impossibility of isolating the results of the medical care program from concurrent Farm Security Administration programs of diet improvement, environmental sanitation, and better housing, it is impossible to state statistically the results of the medical plan in terms of generally improved health.

In the final analysis, the fact that 99 per cent of the medical plans in operation last year are continuing to operate is a telling point, since the whole basis of the medical care plans is *voluntary* cooperation from families and physicians.

New Developments in Underground Drainage for Malaria Control*

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UNDERGROUND drainage for malaria control was used by LePrince and Gorgas in Panama more than thirty years ago. These systems were constructed of tile laid in narrow contour trenches and covered with broken stone. The trenches were completely filled with the broken stone so that some of the surface water would be carried by these ditches. Large stone was placed in the bottom, and smaller stone was placed in the top layer at the ground surface. The excavation was placed on the downhill side of the trench to prevent the impervious material from being carried by the surface water into the voids between the stone, which would destroy the usefulness of the system. The system of underground drainage has proved to be an effective method for permanently eliminating Anopheles breeding areas caused by seepage. Its usage as a malaria control factor is gaining widespread recognition.

Under the malaria control program in Mississippi, underground drains have been constructed using poles, gravel, rock, brickbats, and even tin cans, as well as tile. Experience has proved that "blind ditches," or underground drains, for farm drainage, when properly constructed of poles, will give satisfactory service for a number of years with no maintenance whatsoever. Some farmers have reported that they know of systems that have been installed for over fifty years and are as satisfactory today as when constructed. Poles when placed underground and submerged in water will last indefinitely. Logs buried under 5 and 6 ft. of dirt for indefinite periods have been found to be sound and in good condition. Underground drains constructed of poles 4 years ago are giving satisfactory service today, and should continue to do so for years to come, as they show no sign of failure.

CAUSE OF SEEPAGE

When rock, hard-pan, or other impervious material underlies the surface soil, the ground water, not being able to penetrate it, follows downhill on its upper surface, and where the impervious stratum comes to the surface of the ground, or close to it, there may be a source of water. When small quantities of water appear in this way on the ground surface they are called "seepage outcrops." The line of seepage outcrop may be relatively short or may extend along the entire toe of slope of a hill and become the source of a marsh or swampy area.

Marshes caused by seepage are in most cases permanent, and provide excellent breeding places for the Ano-

* Read before the Southern Branch American Public Health Association at its Eighth Annual Meeting in Memphis, Tenn., November 21, 1939.

pheles mosquito. Breeding areas formed by seepage are generally small, but in some instances ponds and marshes have been formed covering several acres. These areas provide excellent breeding places because the water is fresh and there is an abundance of vegetation to provide food for and protection to the larvae. In the hill section of Mississippi such breeding places are very common. Permanent swamps and marshes so formed, located near towns and centers of population, have been responsible for the production of an abundant supply of the only vector of malaria, Madam Anopheles.

Underground drainage is one of the most effective methods of permanent drainage for malaria control, as it requires no maintenance when properly constructed, and it is not expensive to install.

It is most important that the design of an underground drainage system for the elimination of seepage areas be properly planned and executed. In general, a deep, narrow trench is constructed just above the toe of slope of the hill, and this trench usually follows a contour. The depth of the trench will be determined by the elevation of the seepage stratum and by the elevation of the outlet ditch and, where possible, should be at least 3 ft. deep. This type of drainage must be executed by an engineer familiar with this work, as the conventional design for land drainage will not be effective. Where the seepage outcrop extends well up on the side of a steep slope, it may be necessary to construct a series of parallel contour ditches only a few feet apart along the side of the hill. The line of the drain should be as straight as possible, but when changes occur, tangents should be connected by regular curves. Laterals should enter the main drain at an acute angle.

Narrow trenches, usually from 1 to 2 ft. in width, will be sufficient for all systems. Generally, it is best not to have the trench longer than 500 or 600 ft. If great care is taken in the construction of the individual ditches in the system, there is no great objection to making the ditches somewhat longer. However, with the average inexperienced crew, I would not recommend long underground drains. The grade on drains consisting of material other than tile should not exceed 2 ft. per 100 ft. Grades of 0.20 to 0.50 ft. per 100 ft. will tend to make the system more permanent since none of the soil will be lost by erosion. A profile of the system is made in order to lay a grade suitable to the topography.

The material: poles, rock, gravel, brickbats, tin cans, stone, or other suitable material, should be placed to a depth of from 1 to 1½ ft. in the trenches and covered with straw, grass, leaves, or brush to a depth of approximately 6 in. after being thoroughly compacted. The trench is backfilled to a height of about 1 ft. above the original ground level. Much care must be taken in placing the material in the trenches so that voids will be left for the water to run through. The straw, grass, or leaves placed in the trench acts as a filter and prevents sand or soil from filling the voids. If the soil is very sandy the filter should extend down around the drain. The dirt should be tamped in the backfill to make it as watertight as possible. If poles are used as the material in the drain, the joints should not coincide. Experience has proved that failure always occurs in the filter when two or more joints are placed together. The placing of material should begin at the upper end of the ditch so that the chips, debris, or flotage will be washed away rather than into the finished drain.

The outfall should be protected by building headwalls of brick and mortar, concrete, or rock. Two joints of tile should be used in the drain at the head-

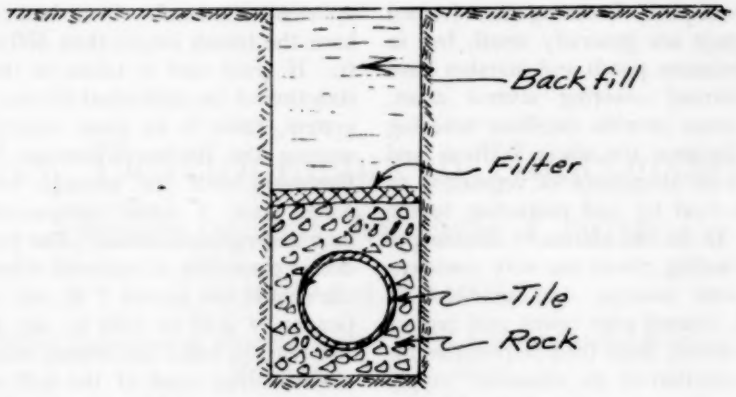

FIGURE 1—French drain using tile set in stone

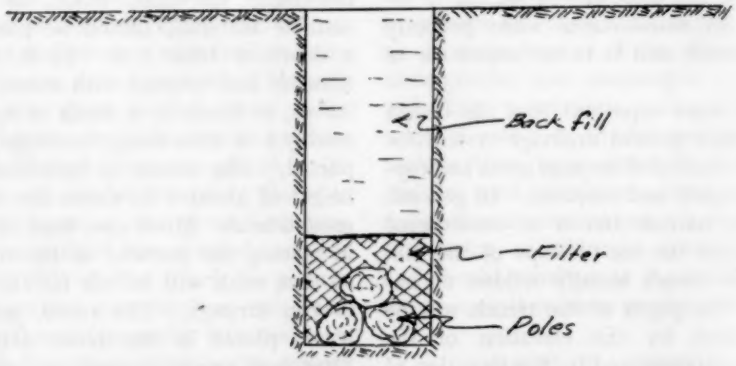

FIGURE 2—French drain using poles

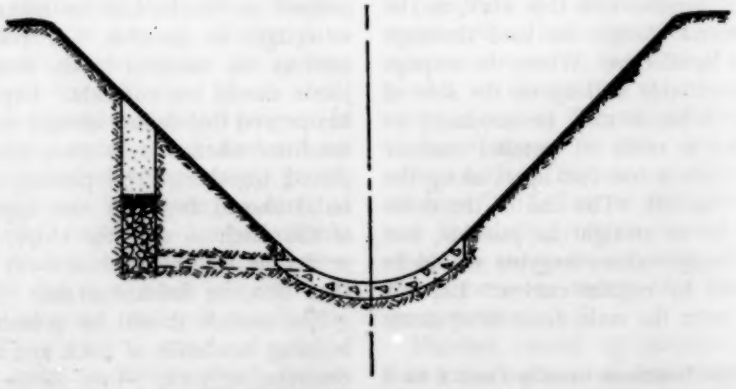

FIGURE 3—Stabilizing of ditch banks

wall to protect the material. Poles deteriorate very rapidly if exposed to the air, and may thereby cause a failure of the whole system.

Uses of underground drainage for malaria control other than intercepting seepage outcrops are: sub-draining open earth ditches, concrete inverts; stabilizing ditch banks; draining marshes caused by springs; and providing outlets for overflowing drinking fountains.

The construction methods for these other uses for underground drainage are about the same as for interception of seepage outcrop. Of course, the location of the drain will vary for the different uses.

Figure 1 shows a French drain, using tile set in stone, Figure 2 a French drain, using poles, and Figure 3 stabilizing of ditch banks.

If the banks of the ditch are filled with seepage and tend to cave in or are hard to hold in place, they can be stabilized by using a small underground drain as shown. A narrow drain is dug perpendicular to the seepage outcrop to a depth sufficient to intercept the flow or to a depth which will permit drainage into the outlet ditch. This drain may be placed in the slope of the bank as shown, or it may be several feet from the edge. The trench should be filled with any suitable material as has already been explained, the filter placed, and the backfill made as in any underground drainage ditch. A joint of small tile is used to carry the seepage water from the drain into the ditch, and should enter the side of the invert 3 or 4 in. above grade. The tile always enters the invert at an acute angle.

Figure 4 shows sub-draining of open earth ditches and inverts. If a great amount of seepage water is encountered which seems to prohibit the construction of an invert in the ditch, the difficulty may be removed by sub-draining the invert to lower the water table as shown in the diagram. The drain is constructed directly under the invert and should be from 1 to 1½ ft. in depth. If the grade of the ditch is sufficient to allow the construction of spillways, the underground drains can be made shorter and their effectiveness

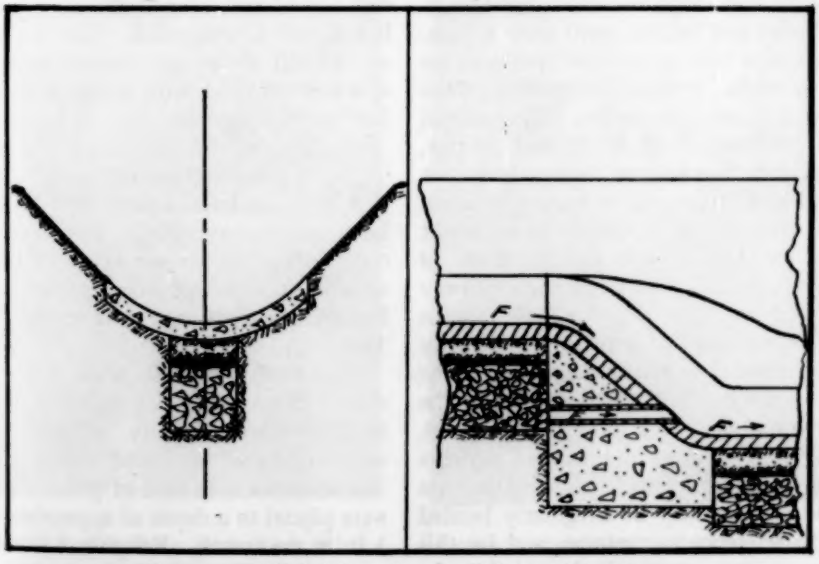

FIGURE 4—Sub-draining of open ditches and inverts

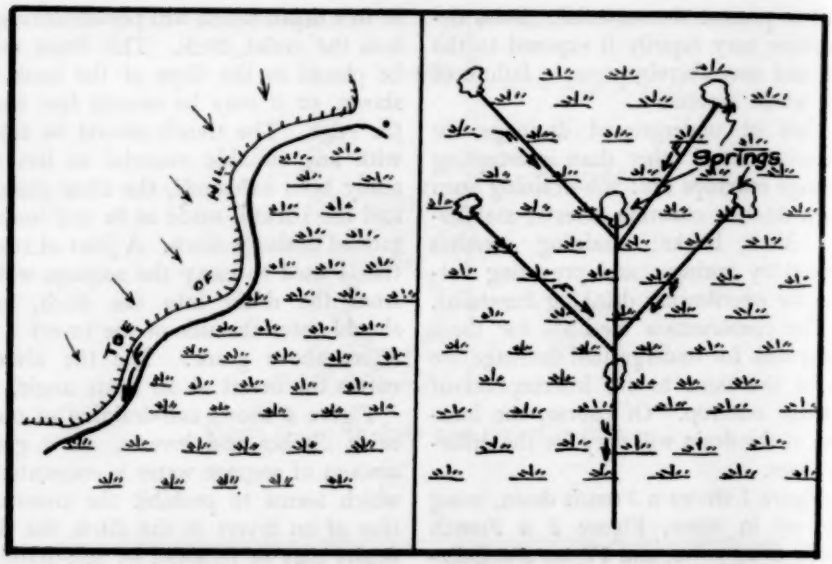

FIGURE 5—Drainage of marshes fed by springs

increased. On ditches having a steep grade, the spillway will serve two purposes; namely, decreasing the grade of the main ditch and making possible the construction of short underground drains.

The sub-draining on open earth ditches will eliminate water standing in potholes and behind small obstructions. It is also best to provide spillways on open earth ditches having very steep grades to prevent erosion. They should be constructed of brick and mortar, concrete, masonry, or rock. It is not advisable to use regular curves to break the grade at the spillways as on invert ditches, but to use abrupt drops of about ½ ft., making the spillway similar to *stair steps*. These abrupt drops will tend to decrease the velocity of the water so that the erosion on the ditch bottom will be decreased. The banks at spillways must be riprapped.

Figure 5 shows drainage of marshes fed by springs. Springs causing marshes and swamps may be irregularly located with reference to contours, and for this reason cannot be eliminated by the regular contour trench. To eliminate the swamps, a system of underground drains is provided, consisting of the main ditch and a separate lateral for each spring, as shown in the diagram. The laterals should enter the main ditch at an acute angle, and laterals on either side should not enter at the same point but should be staggered. The diagram on the left shows the general location of a contour ditch with reference to the flow of seepage water.

COSTS OF CONSTRUCTION

A WPA malaria control crew in Tishomingo County, Miss., was used in constructing the underground drainage system to intercept seepage outcrops, from which costs were determined (see Table 1).

This ditch was 2 ft. wide and 3 ft. deep. WPA rates per hour for labor in Tishomingo County at this time were: unskilled $.27 and skilled $.42. The material consisted of poles. They were placed to a depth of approximately 1 ft. in the trench. Roughly, 1½ cords were used. The poles are valued at $2

TABLE 1

Detail Cost of Underground Drain per 100 Feet

	Unskilled		*Skilled*		
	Man Hrs.	*Cost*	*Man Hrs.*	*Cost*	*Total Cost*
Excavation: 22 cu. yds.	46.29	$12.50	5.66	$2.38	$14.88
Cutting poles and brush	5.07	1.37	0.62	0.26	1.63
Placing poles and filter	17.49	4.72	2.17	0.91	5.63
Backfilling	14.67	3.96	1.79	0.75	4.71
Total	83.52	$22.55	10.24	$4.30	$26.85

per cord. Therefore, the cost of material for 100 ft. of completed ditch was $3. The total cost for labor and material was $29.85 per 100 ft. of underground drain completed.

Figure 6 shows the conditions that existed before drainage at Jackson, Miss. Note the water standing in the entire length of the ditch. This water was permanent and provided an excellent breeding area for the Anopheles mosquito. This seepage was caused by an overflowing drinking fountain in Battlefield Park in Jackson, Miss.

Figure 7 shows the project at Battlefield Park after completion.

ADVANTAGES OF UNDERGROUND DRAINAGE SYSTEMS OVER OPEN DITCHES

The following are good points in favor of underground drainage:

1. Low cost of materials.
2. Low cost of construction. (Costly supervision not necessary.)
3. Low cost of maintenance.
4. More permanent.
5. No land lost for right-of-way, since cultivation can be extended over the drain.
6. Can be used where other types of drainage are impossible.

Since the ultimate cost of the drainage system for malaria control is the one important thing that concerns the sponsors, cheap, effective systems are

FIGURE 6—Conditions in Jackson, Miss., before drainage

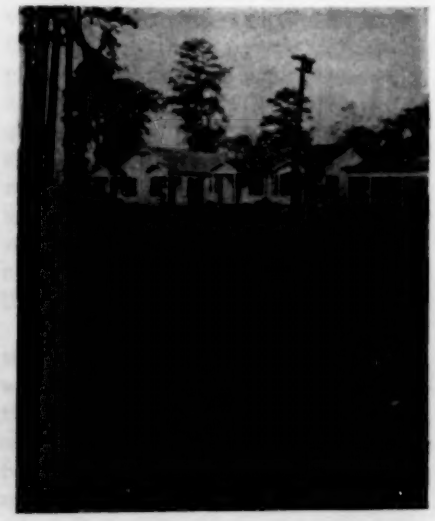

FIGURE 7—Conditions in Jackson, Miss., after drainage

sought. It is nearly always possible to obtain cheap material locally for underground drains: suitable material that the sponsor can purchase at a very low cost. This, in connection with WPA labor, will guarantee a worth while project in poor communities where the cost of expensive drainage systems would be prohibitive.

Once the marsh or swamp is drained, the land owner will, in most cases, immediately begin to put the land in cultivation. This one common interest, if no other, will be sufficient to insure that the system will be properly maintained.

We know that all malaria control drainage systems cannot be underground systems, but we also know that they can be employed and effectively used in a greater number of ways than ever thought possible a few years ago. A few of these new uses have been presented, and I am certain that we all look forward to developing even more ways in which to use this valuable, economical, and permanent method of drainage where conditions indicate its feasibility.

American Defense in Terms of Public Health

TO lift from our people the load of preventable disease, to insure adequate nutrition of the masses, to free our nations from the large and unseen tax for the care of the unfit, to provide opportunities for healthful living, may in the long run be more important as a means of defense than are instruments of war. These objectives are of equal importance for the peaceful progress of our nations.—Dr. Thomas Parran, address at the Opening Session of the Fourth Pan-American Conference of National Directors of Health, May 1, 1940.

Training for Public Health—A Review and a Forecast*

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THE title assigned to me promises a review and a forecast of public health training. For the first part of the title, the review of public health training, I shall go back no farther than the enactment of the Social Security Act in 1935. By providing funds for the extension of public health activities, this Act gave a decided impetus to the whole public health movement, not only in its actual practices, but in the general concept of its meaning and responsibility.

In adapting their agencies to this expansion, administrators were forced at once to cope with a dearth of persons adequately trained for public health work. Even though they consistently tried to select those with the highest degree of training, they often had to accept workers with neither academic nor practical initiation into the principles and practices of public health. Some of these public health workers, to use a good colloquialism, "just didn't know what public health was all about."

Fortunately, while the Act provided for training of personnel, wisely enough no specifications were set up as to the manner in which they should be educated. Administrators were left free to develop what they considered suitable programs of training, and the training funds were used in a variety of ways. Stipends were allotted to individual workers for a year's training in a recognized school of public health. Short-term courses were planned by many of these schools either as a part of the regular courses or as a condensed presentation of the more salient points in the complete curriculum. In-service training courses were inaugurated. Some of these were exceedingly well planned programs and others ranged down through more or less well constituted plans to single demonstrations which made their brief appearance and vanished. A frequent type of in-service training was the occasional discussion group, called together as problems arose, and valuable in proportion to the reality of the problem and the insight, experience, and enthusiasm brought to bear upon it. Traveling fellowships were also provided and tuition was paid for students who were to take care of their other expenses. Several states organized their own field training centers.

All these methods have had a considerable vogue and all can be credited with helping to improve the quality of the public health staffs, though the results of each method will vary between groups of personnel, between agencies, and between states. At any rate, all have undoubtedly helped to raise the level of training, and we have statistical evidence to show that this

* Read at a General Session on Professional Education of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 18, 1939.

level of training has risen with the use of Social Security funds. Some measure of this improvement was given you in the paper on "Educational Qualifications of Staff Members in Health Departments," presented at another session of this meeting.[1] A tabulation comparing qualifications of public health workers appointed within the past three years with those employed prior to that time shows that the "newer" personnel on the whole possess a higher degree of training for their work.

Even with this improvement, the data from this study of qualifications reveal, as was pointed out in the previous paper, a great lack of specific public health training among those now at work in the field. Of the 14,000 physicians, nurses, and sanitarians represented in the study, approximately 907 physicians, 2,890 nurses, and 3,081 sanitarians have had no academic training at all in the special technics of their profession. Another 4,942 of this group of 14,000 have had no more than the brief sort of field training obtainable in a special orientation course of some 2 weeks' to 3 months' duration.

Thus, even though a great effort has been made during the past few years to provide training for workers, and even though decided progress along that line can be claimed and proved statistically, health administrators still have a long distance to go before it can be said that the field at last is staffed with well qualified and adequately trained workers.

What we can do, however, at this stage is to take time out and define our aims. Our concern must be not what we can do, but rather what we should do. In other words, what should be the responsibilities of the schools of public health, and to what extent should health administrators feel obliged to provide training for their personnel? These are large questions to which I cannot presume to give final answers; the most that any speaker can do right now is to bring them up for discussion.

It is reasonable to assume that 85 to 90 per cent of a public health worker's technical knowledge should be secured in his basic professional school, and that public health schools should not be expected to supply anything except specific public health training which should constitute about 15 per cent of his technical equipment.

A student may major in history and come out of college with his mind full of the wars, crusades, reforms, revolutions, and what-not that men have waged for, lo, these many centuries. But he is not a teacher unless he has the skill to transfer all this to a roomful of young minds so that they may gain some comprehension of the pageant of mankind upon this planet.

So it is with the doctors, nurses, and sanitarians who seek a career in the field of public health. Their public health training grooms them for that particular field. It initiates them mentally and professionally into the carrying on of large-scale health activities. It teaches them to adapt their knowledge and technics to the community—the community both as an environment and as a population. It leads them to think in terms of many people, the sick, the well, the disabled, and the mildly ailing, for all of whom public health carries on programs of protection and instruction.

There are many who assume that any doctor or nurse can be a public health worker; that becoming one involves no change or orientation; in fact, nothing more than declaring one's intention and securing a job. They will argue that public health work is no more than the intelligent use on a broader scale of fundamental knowledge. Educators complain that we regard health education simply as a camp follower of other knowledge; that the basic information is all that is necessary, and with it

under his belt the worker can step bravely forward toward one of the most important objectives of the field—education of the public in the ways of health. These educators doubt that a great movement like public health can become thoroughly educational without having its workers skilled in the technic of educating.

While I am on the subject, let me bring in one nearer to my own experience—administrative technic. This is particularly needed by those responsible for administering the programs—the health officers, bureau directors, supervisors, and so on.

By administrative technic I mean more than dictating a report or signing official documents. A trained administrator will take pleasure in formulating an original and rational program to fit the special needs of his community; an untrained administrator will use a sample program from a book and try to make the community fit it. The capable health administrator becomes in the natural course of his work a leader in the community. The inept (and this in some cases is synonymous with untrained) administrator continues as a not very clearly defined health officer in the public's mind. The good administrator is also a genuine leader to his personnel; he keeps them interested, enthusiastic, keen. The indifferent one may be simply " the boss."

Though some may claim that capable administrators are born, not made, we know that the successful handling of people can be learned under proper instruction. Salesmen are taught to handle other personalities skillfully. So are missionaries, teachers, demonstrators, barkers, ushers, and so on through the whole list of occupations wherein the individual must acquire a skillful approach as a part of his job. Business has recognized for a long time that the better part of success lies in the ability to win the public, and the field of health is now laggardly catching up with this point of view. I have been in many health organizations where I felt that the health officer, trained in a school of public health though he might be, would profit by a course in modern business administration.

A few years ago a similar lack of training existed among teachers and the idea was quite common, both within and without the field, that anybody who knew the subject matter to be taught could be a teacher. This idea was overruled and the weaknesses were overcome after a series of objective studies had been made and the disciplines indicated applied. Very minute job analysis studies were made by experienced observers. They studied the task or problem, the worker, and his method of handling it, and developed suggestions for the types of training and experience that would help such workers in solving similar problems. As a result more practical training courses were instituted through which the students solved problems, engaged in practise teaching, and acquired facility for the specific tasks they would be required to perform when employed. Some such objective studies of health workers and their problems would without doubt yield valuable suggestions in preparing new workers for the field.

So much for the courses of study. Another thing we shall have to decide is whom we shall train. Shall we continue to employ professional people (physicians, nurses, and other scientifically trained workers), and then assume the responsibility of giving them their public health training? In great degree that is what we have done in the past. Shall we continue it in the future?

I think without doubt the answer should be " no." It seems to me we can reasonably ask that our personnel come to us already trained for public health work. For all its comparative youth,

the public health movement has the prestige of an honored institution. The tenure of office for its workers grows increasingly stable. In more and more jurisdictions the salaries offered may be described as substantial. Public health is rapidly becoming a career service, and there is no reason why the new worker should not secure his own basic training. Naturally there will be specific tasks he must learn after he gets on the job, but we expect him to bring his basic training with him.

As I say, it seems to me we are all within our rights in presenting such a front to incoming personnel. But how about existing personnel? What shall be our attitude toward training them? The paper on qualifications to which I have been referring shows that about 22 per cent of the physicians, 12 per cent of the nurses, and 2 per cent of the sanitarians have had at least 1 year of training in a graduate school of public health. This group, to my way of thinking, should be left out of our calculations in the provision of formal training, though by "left out" I do not mean that we should neglect them or shove them aside. Having had a year or more of formal public health training, this group may be considered trained, but we cannot by that token just wave them on their way with the admonition to keep themselves out of a rut. Even though we do not provide formal training, we must see that they have some broadening and stimulating experiences, through in-service training courses, round table group discussions, and the like. It would not be amiss to include an occasional traveling fellowship to give a worker experience in a particular line.

The large number of personnel without specific training in public health offers a more difficult problem, and along with our responsibility for carrying on public health activities goes the responsibility of training workers so that these activities may be properly conducted. Among the 14,000 whose qualifications have been discussed before you, about 6,800, or some 48 per cent, report no specific public health training. Since we cannot consider providing a full year's training for so large a number, we must select, by such criteria as appear to us wise, those who are to receive training. The State and Territorial Health Officers have set up certain minimum educational requirements which trainees must possess. Some states have gone no farther than these minimum requirements in selecting persons for training, but other states have consistently chosen only those persons whose educational backgrounds are considerably more complete than the minimum requirements demand.

The wide variance of the different state training programs is well illustrated by a study of 1,938 trainee questionnaires from half a dozen selected states.

In 5 of the 6 states examined, over 90 per cent of the sanitarian trainees had had some education beyond the minimum high school requirement. Moreover, 60 per cent had received a college degree, two-thirds of whom held their degrees in the fields of science or engineering. In contrast to this, the 6th state chose only 55 per cent of its sanitarian trainees from persons with college training, not one of whom held a college degree.

The same sort of variation, only more pronounced, is evident in the selection of nurses. One state reported that 80 per cent of its nursing trainees had had some previous college education. Another state showed barely 8 per cent of its candidates with such training. In the first state 20 per cent of those awarded training held their college degree, and in the second state the per cent was only 3.

Certainly one of the criteria for selection of trainees should be a thorough

educational background, which in itself is some indication of an aptitude for acquiring new knowledge and technics.

A second criterion might well be: How many years of service does the prospective trainee have before him? In other words, how old is he? Not all the states have consistently applied this criterion in selecting their candidates. The method varies from state to state. Several states in which the training programs were studied are making a definite effort to select the younger physicians for training. In two states all of the health officer trainees with no previous public health experience were under 35. The majority of them were under 30.

In another state, 40 per cent of the physicians trained were past 35 years, and two-thirds of them had had no previous experience whatever in public health. Still another state sent 2 doctors away to receive health officer training, one of whom was past 50 and the other past 55. Both had had about 30 years of private practice and no previous public health training or experience.

It is true that one has to be cautious in making selections based solely on age. If we choose our trainees by the extremely practical consideration of what may be expected from them in return for their training, the chances are we shall select the larger number from the younger people. On the other hand, in the older groups we have those many workers who have profited richly from their experience, the type who continue to extract learning from every situation they meet; persons of insight who would bring back from a trip on a traveling fellowship a wealth of ideas for their own jobs; persons of judgment, of skill, of clinical experience, of wisdom and tact, who should have the chance to catch up on the new knowledge in their profession. There is no measurement of the returns they will make from a chance at gaining more training and experience.

One thing to bear in mind when selecting trainees is whether it is either wise or proper to use tax funds to train individuals for a career in public health who already have spent their most productive years in other fields.

As to personnel who have spent years in the field and still remain comparatively untrained, we must provide in-service "refresher" courses and all other means possible to raise the quality of their work until such time as they leave the field or retire.

Signs of the times foretell for the future a broadening program of public health. They show an increasing need for specialists as the programs take on special responsibilities. There is increasing evidence that public health will have to assume responsibilities for administration of programs on medical care, including operation of hospitals, clinics, and various other schemes of medical service. The public health movement, in the new aims for the eradication of disease set for itself, will need not only consultants skilled in the control of cancer, pneumonia, syphilis, and the degenerative diseases, but men who know the administrative end of such work. It is difficult for specialists to strike the right balance between training in their specialty and training in administration and public health. But it must be done if the specialist is to be able to see the job in its entirety and not just in part.

One other administrative problem must be solved if the funds spent for training are to serve their purpose. Such training is intended to produce additional services and better services in public health. It should go without saying that a person accepting training is figuratively giving a promissory note for services to be rendered in return. In other words, he will return to the

field and work. The turnover among personnel who have received public health training at public expense, however, is great enough to suggest that perhaps there should be a written understanding with regard to the responsibilities of the trainees.

From February, 1936, to the close of the fiscal year of 1939, approximately 5,000 persons had received training financed in whole or in part by Social Security funds. The progress to be expected from such an amount of training is considerably diluted by the number of those who did not return to the field of public health work, or returned only for a short time and then left.

In conclusion, it may appear that this paper has done nothing but raise items for consideration—but that is just the point, these items well considered will be our guide to future policies. We cannot carry on activities that will dovetail into an excellent nation-wide training program until we have learned the answers to questions that bob up the minute we undertake to provide training for personnel--answers to such questions as: What do we mean by public health training? Whose is the responsibility for giving it? Whom shall we train? By what criteria shall we make our selection?

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Supervision of Public Health Nurses A Continuous Educational Program

From the Point of View of the Rural Agency*

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RECENTLY the writer was called upon to appear before the Board of Health of one of the western states in defense of supervision of public health nursing. The defender felt inadequate in the presence of a mixed board consisting of a lawyer, four medical practitioners, a druggist, a dentist, and an osteopathic physician, who were from the outset opposed to expenditures upon personnel who were obviously not direct distributors of service to the consumers. According to their line of thought, the salaries expended for supervision could much better be spent for medical service and direct nursing care for the indigent. All answers to the arguments presented by the spokesmen of this board seemed to fall flat and to have no meaning for the "doubting Thomases" composing the board. Even an analogy between nurse supervision in a hospital and nurse supervision in the public health nursing field was rejected as worthless.

The situation which confronts the speaker today in facing an audience composed perhaps entirely of public health nurses—supervised and supervising—is almost diametrically opposed to the situation first described. You are already convinced of the various values of supervision. Among public health nursing groups supervision has for so many years been taken for granted that any attempt to defend it here would seem unnecessary. It might, however, be appropriate to quote Dr. Parran's justification for general public health supervision which he presented in his address to the public health nurses at the American Public Health Association meeting in New York in 1937:

> Without able administrators and executors of sound public health policy, without a considerable addition to the ranks of those who can both interpret and create, without adding year by year to the ranks of those qualified for leadership, I see the probability of a levelling out in public health accomplishment.[1]

The purpose of this paper, as suggested in the title, will be merely to summarize some of the educational phases of supervision, with specific reference to rural programs. The examples cited will be taken from the western states, since they comprise the area most familiar to the speaker.

The word "continuous" in the title implies a continuing from the beginning that has already been made in basic nursing education, and in public health nursing education. This is particularly true in the West where almost all who enter upon rural public health nursing

* Read before the Public Health Nursing Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 20, 1939.

have had some theoretical instruction in public health nursing, and many have had at least a year of university study with a major in public health nursing. It can be seen, therefore, that the province of supervision in the western states is one of assisting the staff nurse in the application of general principles which she has already learned more or less theoretically at the university. But, to quote again from Dr. Parran's 1937 address:

> It takes more to make a good public health nurse than an R.N., some years of nursing, and a public health nursing course in one of the schools which offer sound postgraduate courses. When we have learned the intangible what and why which separates the efficient from the futile, among those with similar technical backgrounds, we shall have learned the basic lesson in personnel management—or vocational adjustment, call it what you will—which needs to be learned promptly.[1]

The public health nurse recognizes her need for more than an R.N. and a public health nursing course, and therefore she not only expects and accepts supervision, but in the rural area she welcomes the supervisor as a teacher who is able and willing to help her find the answers to her specific problems. It is interesting to note that the better prepared the nurse is, the more analytical of her own needs she becomes, and, consequently, the more articulate she is in requesting specific assistance; usually, too, the better work the nurse is doing, the more eager she is for supervisory help.

We are all agreed at the outset, no doubt, that among the functions of public nursing supervision, three are of great importance: (1) the improvement of public health nursing service, both in quality and quantity; (2) the improvement of the worker; (3) the arousing of a greater demand for service, as an outcome of better community understanding and appreciation of the service.

The improvement of the service depends so much upon the improvement of the worker, and the two are so intimately linked together, that the inclusion of both will be implied in the discussion that follows.

How can the rural supervisor assist in the improvement of the nursing service and in the improvement of the nurse herself? She may begin with the introduction of the new nurse to the field, either through a group conference or an individual conference with the new nurse. The length of this introductory period varies in the states of the western district from 2 or 3 days to 3 months. The 3 day period in one state covers a bird's-eye view of the state health department, an explanation of the relationships of the division of nursing to other divisions, a brief introduction to the nursing manual, a glimpse at the record and report forms, and at the list of state health and welfare agencies. She is also expected to read reports from the county to which she is assigned, and to note the names of local community leaders.

In another state, the introduction to the field may consist of 3 months of carefully planned experience in a well organized local health department. The new nurse coming into this situation will have had at least 1 year of public health nursing study in a university offering an approved curriculum; and in most instances she will have had the field work required by the university. She may have had also public health nursing experience in another state. The purpose of this type of introduction is to orient the nurse to an entirely new environment; namely, a Spanish-speaking population, with a background of racial and family customs, superstition, and dietary habits that are totally new to the public health nurse. Additional difficulties are the great distances over treacherous roads through sparsely settled areas, uncertain weather conditions, and absence of telephone communica-

tion. It is felt in this state that the new nurse can learn to cope with these various factors only through a rather long period of guidance in an environment similar to the one she will find in her own county.

In a few instances, the supervisor, by way of introducing the new nurse to the field, accompanies her to the county and remains with her for a few days during the orientation period; or she may visit the new nurse soon after her arrival at her new post. On later visits the supervisor may give individual assistance through office conferences, or visits with the nurse in the field, through answers to specific questions, or through guidance in reading or in selection of further courses. From the office the supervisor may help through letters, or through library facilities which some states make available to field personnel.

Two of the western states issue a monthly public health nursing bulletin; one state buys space in the monthly journal published by the state nurses' association; another state is invited to contribute to the monthly journal of the state nurses' association; the nursing division in several states contributes to the bulletin published by the state department of public health.

One state uses the public health nursing bulletin as a very definite educational tool. Each issue contains at least one article on subject matter that public health nurses are expected to know; some reference material; notations on procedures, technics, standards or policies that need to be emphasized or modified; occasionally a book review; and frequently suggestions regarding community organization. In the instance of this state, some of the material in the monthly bulletin is designed to pave the way for the next educational conference.

Another way in which a state supervisor may help the rural nurses to improve their services is through group education plans. In all of the western states and, no doubt, in most of the states throughout the country, the state supervisory staff takes the initiative in formulating plans for staff education conferences. If the conference involves nursing personnel from several counties, the conference is usually planned for one day and in some instances for two days, rarely for a longer period.

One state in the West has effected plans in coöperation with the state university for conducting extension courses in three or four centers throughout the college year, by means of which all public health nurses may have the opportunity to continue their university study in fields related to public health, with or without credit.

Staff education conferences have given an admirable opportunity for democratic sharing of responsibility. For instance, in one state, the initial step in preparation for the conferences was a letter sent to the various public health nursing agencies and to nurses working alone, requesting that they select from the list of proposed subjects for the quarterly conferences their first, second, third, and fourth choices, and to add any other topics which they might choose. The selection of topics for the year's discussions was based upon the nurses' expressed preferences. They were asked to choose also whether they would have a group luncheon on the day of the conference. The district units of the State Organization for Public Health Nursing were requested to make arrangements for the several places of meeting and for a person to register those in attendance. One of the local nurses was asked to preside at the meeting in her district; others were requested to present case studies.

Similar democratic participation in planning is found in most western states. In one state, the nurses themselves decide upon the frequency of staff meetings, their duration, and the centers at

which they shall be held, as well as the method of conducting the conferences.

Democratic sharing of responsibility in one state is evidenced by the appointment of a committee of staff nurses to set up the form for the evaluation of the staff nurse's work. In many instances, the staff nurses are encouraged to evaluate their own work; and it is usual for the supervising nurse to discuss her evaluation of the staff nurse's work with the nurse, in the interest of stimulating improvement and encouraging progress.

The educational content of the supervisory program will center around several broad needs of the nurse. In the first place, the nurse may need help in outlining her objectives and formulating a program to fit the community she is serving. How shall she select from the multiplicity of possible objectives and activities the specific objectives and particular services that will bring the most far-reaching benefits to that community? The supervisor can help her first in analyzing the needs upon which the selection and proportion of services should be based. In some instances, of course, the nurse may have little opportunity for defining objectives and choosing services. The local health officer may be the determining factor in apportioning time and emphasis to various phases of the program; or the directors of various special divisions of the state department of health may heavily influence the choice. In many situations, however, the generalized supervisory nurse, through her own tactful and constructive suggestions regarding the program for the particular health department, can demonstate the value of the nurse's contribution to program planning, as well as to execution of the plan.

In the second place, the supervisor often finds it necessary to stimulate and assist the staff nurses in revising and supplementing their body of knowledge so that their teachings may be scientifically accurate and up-to-date. Since most of the nurses in the western states are engaged in generalized public health nursing, it is necessary that their knowledge of maternity and child care, communicable disease control (including tuberculosis and venereal diseases), and orthopedic nursing be well rounded. Since public health has its roots in the biological sciences, it must constantly expand its body of knowledge to keep pace with the continuous advances resulting from scientific research in these fields. Furthermore, the scope of public health is now being extended to include pneumonia control, cancer prevention, adult hygiene, and certain problems in housing. It would seem safe to predict that the horizon of public health will probably continue to broaden indefinitely.

In addition to program planning ability, and breadth of scientific knowledge, the public health nurse must have the ability to carry out nursing procedures and technics according to the standards set up by the state division of public health nursing. These technics and procedures are usually demonstrated to the new nurses in group conferences and again when changes are necessary from time to time. In one state films have been made to show various technics. The supervisory nurse, after observing the staff nurse's technics in the field or in the clinic, can assist her in eliminating unnecessary motions, in increasing safety, speed, and acceptability of the procedure to the patient; and at the same time, she can help the nurse to gain greater satisfaction from skillful and successful performance of technics.

Another educational opportunity for the supervisor lies in the field of educational methods used in teaching the individual or the family, and in teaching more or less formal groups. Here again

the nurse needs assistance with the modification, adaptation, or application of general principles to the local condition or individual situation with which she is confronted.

Still another area of educational assistance for the supervisor is in the field of community coöperation. Most young nurses need a great deal of guidance in this field. They do not understand the value of lay groups as volunteer assistants or as interpreters of the health work to the community at large. Nor do they know how to make use of such services.

Some of the problems of educational supervision in the West, as already hinted, are related to the vastness and topography of the territory, and the sparsity of population. Whether the staff nurses are to come together for a group conference or the supervisor is to visit the individual nurse in her own field, the time and cost of travel are items of considerable importance. Many of the staff nurses travel from 50 to 200 miles to attend a group conference of one or two days' duration. When mountain driving is involved, as it usually is, a day for travel to the conference and another day for the return trip may be required. Portions of the mountainous territory are isolated for weeks during the deep winter snows, and these posts become inaccessible to the supervisors.

In two of the western states, the area served by the supervising nurse coincides with the area served by the district health officer. Since, under this plan, each supervisor resides in her own district, the distances she has to travel are lessened. But when a state the size of Utah is divided into 5 health districts, the supervisor still has a huge area to cover. Two of these districts embrace more than 18,000 square miles each; in other words, both New Hampshire and Vermont could fit into the area covered by one of these districts. Massachusetts and New Jersey could fit into another district, which covers more than 17,000 square miles. As a matter of fact, Utah could accommodate 10 districts the size of Massachusetts, and still have ample room for Rhode Island.

Other problems related to the difficulty of distance are the infrequency and brief duration of the supervisor's visits. The field nurse may send an urgent request for immediate supervisory assistance; but possibly 4 weeks or even 6 weeks may elapse before the supervisor can visit that nurse. Often the nurse feels that the supervisory visit has been far too short, and that only a few of her problems have been taken up with the supervisor. She is so isolated and has so little opportunity to counsel with an experienced fellow worker that she craves a more generous allotment of the supervisor's time.

Another problem that confronts the supervisors in the western district is that each supervisor has additional responsibilities beyond her general educational functions. For example, she may have many administrative duties; or she may be a special consultant in maternity and child health or in tuberculosis, or educational director for the staff; or she may be all of the supervisors and consultants rolled into one, as well as nurse administrator.

In order to complete the picture of rural supervision in the West, it may be well to add that in some of the county health departments, where the nursing staff is large enough to justify the position of supervisor, there is a resident county supervising nurse. In one state, the county public health nurse who gives leadership to a small staff of nurses is designated as the senior nurse. She has some supervisory responsibilities, but also carries a staff load. This type of county receives the services of a state supervising nurse.

If the objectives of educational super-

vision have been realized, the result should be improvement both in the work and in the worker. Measures of increased efficiency will be: more acceptable and more skillful service and a greater output of work. A growing appreciation of the more efficient service should be evidenced by larger demands for service and a willingness on the part of the community to pay for extended service; and further, perhaps, a willingness of various agencies to coöperate in a plan for generalization of already existing specialized services. Even though the Utopia of generalization cannot everywhere be realized, supervision which has helped to develop a successful local health program and is able to command respect for the organization which provides such supervision, should stimulate other administrators, such as superintendents of schools, to call upon the state supervisory group for assistance in the selection of public health nursing personnel for positions in their agencies.

Improvement in the worker should be marked by increasing capability of self-direction, worth while original contributions, constructive criticism, a willingness to accept change in the interest of betterment, democratic participation both in the formulation and in the execution of plans, evidence of the creator's joy in artistic accomplishment, and the evidence of a desire to excel one's former self.

Educational supervision should lead also to improvement, not only in the nurse's professional proficiency, but also in her social efficiency, adaptability, and happiness. It is extremely gratifying to witness the adaptation of the successful public health nurse to her new environment in the West. Her readily learned loyalty to the local life, its interests, and peculiar charms, and her quick embrace of the prides, joys, and enthusiasms of the people with whom she works are sometimes almost amazing. The supervisor who is able to impart her enthusiasm for and enjoyment and appreciation of the offerings of a particular locality so that she can help the staff nurse in a new environment to identify herself with the people of the community, may consider herself crowned with success.

Such ideal democratic supervision should also promote the development of leaders from the ranks of staff nurses. The West seems to offer a particularly advantageous setting for such development. The well prepared nurse now returning from the university finds that her rural field assignment challenges her resourcefulness to the utmost, affords opportunity for administrative responsibility, and demands the exercise of her full capabilities. The wise supervisor will proudly watch her grow.

REFERENCE

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The Federal Cancer Program*

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THE character and scope of the federal cancer program are determined by the provisions of the National Cancer Institute Act of August 5, 1937. It seems to me the best way to discuss this program now is to review briefly the steps taken to carry the provisions of the Act into effect.

The purpose of the Act is to provide for and to foster the continuous study of the causes, the prevention, the diagnosis, and the treatment of cancer. For this purpose there is established in the Public Health Service a division which shall be known as the National Cancer Institute. I now quote practically without change section 2 of the Act:

> The Surgeon General of the Public Health Service is directed, in coöperation with the National Advisory Cancer Council—
>
> (a) To conduct, assist, and foster researches, investigations, experiments, and studies relating to the cause, prevention, and methods of diagnosis and treatment of cancer;
>
> (b) To promote the coördination of researches conducted by the National Cancer Institute and similar researches conducted by other agencies, organizations, and individuals;
>
> (c) To procure, use, and lend radium as prescribed;
>
> (d) To provide training and instruction in technical matters relating to the diagnosis and treatment of cancer;
>
> (e) To provide fellowships for cancer research from funds appropriated or donated for such purpose;
>
> (f) To secure for the National Cancer Institute consultation services and advice of cancer experts from this country and abroad, and to coöperate with state health agencies in the prevention, control, and eradication of cancer.

At this point a few words of explanation of the National Advisory Cancer Council may be in order. The purpose of this Council, which is an appointed body of 6 members with the Surgeon General as ex officio member and chairman, is to advise the Surgeon General with respect to carrying into effect the provisions of the Cancer Act. Specifically, the Council is authorized to make recommendations in regard to cancer research projects submitted to it or initiated by it; to spread information about cancer studies "for the benefit of health agencies and organizations, physicians, or any other scientists, and for the information of the general public"; and "to review applications from any university, hospital, laboratory, or other institution, whether public or private, or from individuals, for grants-in-aid for research projects relating to cancer, and certify approval of projects deemed worthy of support."

The members of the Council first appointed were: Arthur H. Compton, professor of physics, University of Chicago; James B. Conant, president of Harvard University; James Ewing, director, Memorial Hospital, New York; Ludvig Hektoen, director, John McCormick, Institute for Infectious Dis-

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eases, Chicago; Clarence C. Little, director, Jackson Memorial Laboratory, Bar Harbor, Me.; and Francis C. Wood, director, Institute of Cancer Research, Columbia University, New York. The term of office of two members ends each year and at the end of the first year James Ewing and Francis C. Wood were succeeded by James B. Murphy, member of the Rockefeller Institute for Medical Research, and Mont R. Reid, professor of surgery, University of Cincinnati.

For the fiscal year ending June 30, 1938, Congress appropriated $400,000 for the cancer program of which $200,000 were for the purchase of radium. For the fiscal year 1938–1939, $400,000, and for the current fiscal year (1939–1940), $570,000 have been appropriated for the general purposes of the Cancer Act, without any specific allotments. I shall now discuss briefly what has been done to carry those purposes into effect, as a rule after conferences with special groups.

First, cancer research—Congress appropriated $750,000 for the building and equipment of the National Cancer Institute. The building, which is now being taken into use, is located at Bethesda, Md., on ground donated by Mrs. Luke I. Wilson and adjacent to the new buildings of the National Institute of Health. The development of an outstanding center for cancer research is assured. The chief of the Institute is Dr. Carl Voegtlin. The work is organized along the following broad fundamental lines.

1. The systematic study of the different primary factors which are concerned in the production of cancer in laboratory animals, in order to secure knowledge which may be useful in the prevention of human cancer.

2. Work on the mode of action of cancer producing agents, such as pure chemicals and radiations, for a better understanding of the carcinogenic process.

3. Biological and biochemical studies on cancer cells in order to seek an explanation for the characteristic biological behavior of such cells as compared with normal cells.

4. Work on experimental therapeutics using certain promising agents; and, in collaboration with the Bureau of Standards and the Carnegie Institution of Washington, a comprehensive study of the relative effectiveness of low, medium, and supervoltage x-rays, radioactive isotopes and neutrons.

A unique feature of the Institute is the opportunity for close collaboration of its scientific staff of about 30 competent scientists, representatives of physics, biochemistry, chemistry, biology, pharmacology, pathology, and bacteriology as well as statistics. The Institute also collaborates in exchanging information with other research laboratories. For the purpose of correlation close contact will be maintained with the recently opened tumor unit in the Marine Hospital in Baltimore. It is also planned to collaborate with certain university cancer clinics engaged in research.

Second, radium—As stated, $200,000 were set aside for the purchase of radium. The Cancer Act itself authorizes the purchase of radium from time to time, and that it be available for the purposes of the act; further that "for such considerations and subject to such conditions" as shall be prescribed by the Surgeon General, radium may be loaned to institutions in the United States "for the study of the cause, prevention, or methods of diagnosis or treatment of cancer, or for the treatment of cancer." Nine and one-half grams of radium have been purchased. Applications from 36 hospitals have been approved and shipments of radium are going out as fast as the radium is tested at the Bureau of Standards. Among factors taken into account in considering applications are the training and experience of the radiological staff, the equipment for radiotherapy, the need for radium in the community, and the number of cancer patients treated in the institution in question. Every effort

has been made to effect an equitable distribution of radium in order that as many sections as possible may have the benefit of its use. Each applicant is required to obtain the approval of his application by the state health department and the state cancer commission in states having such commissions established by law, or a statement explaining why approval is refused. This requirement is made in order to secure coördination with any cancer program carried on in the state by official agencies.

Third, training in technical matters relating to the diagnosis and treatment of cancer—The framers of the Act obviously were impressed with the needs of clinical cancer training because special provision is made for such training of proper persons who may receive a per diem stipend not to exceed $10 while in training. On the advice of the Cancer Council the Surgeon General submitted this matter for the consideration of an important group of representative consultants (Dr. James Ewing, chairman) who agreed that in order to promote the wider use of the best methods of diagnosis and treatment, opportunities for special training should be provided for physicians who wish to devote themselves to cancer work.

There are now some 25 carefully selected young physicians at work in coöperating cancer centers. Here is acknowledged the invaluable coöperation of these centers by their acceptance of trainees for instruction, along broad basic lines as well as for special purposes. The future careers of cancer trainees will be followed with special interest. A graduate of an approved medical school, who has completed a year's interneship in an approved hospital and who is not over 40 years of age, may be eligible for training provided he intends to devote himself to the clinical diagnosis and treatment of cancer and can furnish reasonable assurances that opportunities for such work will be available when he finishes his course. As a rule stipends for training will not be awarded for continuation of the applicant in the position he is holding at the time he makes his application. Only in exceptional cases will training be provided for a period of less than a year. In most cases at least 2 to 3 years will be desirable. Appointment as trainee is necessarily contingent upon the applicant being acceptable to a training center. In addition to interneship, prescribed training in surgery may be required. It is believed that the system of training in the diagnosis and treatment of cancer fostered by the Cancer Act, tends to promote the growth of facilities for instruction in clinical cancer work.

Fourth, fellowships in cancer research—The Act authorizes research fellowships "with such stipends and allowances" as may be deemed "necessary to procure the assistance of the most brilliant and promising fellows from the United States or abroad." Fellowships with reasonable stipends for work under proper conditions are highly important in developing investigators. With this objective in mind a number of fellows, men and women with promises of productive research, have been appointed for work on various phases of cancer—biochemistry, carcinogenesis, genetics, lung cancer, pathology.

Fifth, actions by the National Advisory Cancer Council—When the Cancer Act took effect the cancer research in progress under the auspices of the Public Health Service was concentrated in the National Cancer Institute. The Council approved the general program and also projects dealing with cancer statistics, incidence, and treatment. The studies of cancer incidence and treatment have yielded results of interest. The Council is charged with passing on applications for grants-in-aid of research relating to cancer. So far, 102 applications totalling 1½ mil-

lion dollars have been considered and 19 have been approved, the grants amounting in all to $159,000. The largest grants have been made to the University of California, toward the establishment under the direction of E. O. Lawrence of a cyclotron laboratory in biological and clinical work with special reference to the treatment of cancer. Grants have been recommended also for the American College of Surgeons toward the study of cancer clinics and hospitals, and in a small way for special needs of cancer clinics. The Council is interested in the possibility of more support for cancer clinics, especially when connected with medical schools and centers for cancer training. The Council approved in principle the establishment of a cancer unit in the Marine Hospital at Baltimore, with clinical, research and teaching facilities, in order to meet the cancer needs of the beneficiaries of the Public Health Service east of the Mississippi. The number of these beneficiaries is 170,000, 40,000 of whom are now in the cancer age.

Finally a few words about coördination and coöperation in federal anti-cancer activities. One of the first steps under the Cancer Act was the calling by the Surgeon General of a conference of representatives of foundations, medical schools, and other organizations for a discussion of the fundamental aspects of the cancer problem. A result was the appointment of a special committee (Dr. James B. Murphy, chairman) to consider the matter. This committee has analyzed and clarified the fundamental cancer problems in a report of great value to cancer investigators.* I have mentioned the recommendation by a group of consultants that special training be provided in the diagnosis and treatment of cancer. A committee, with Dr. Mont R. Reid as chairman, is working on cancer nomenclature with a view to securing better and more uniform records. By way of carrying out the provisions of the Cancer Act which directs that there shall be "coöperation with state health agencies in the prevention, control, and eradication of cancer," an office of states relations has been established. This office is prepared to furnish information and advice concerning anti-cancer programs and activities. Several states have availed themselves of this service.

I need not remind you that cancer is a major health problem because of its frequency and because most cancer patients are unable with their own resources to meet the costs of treatment. Several states now have laws providing for steps toward more adequate cancer service and as illustrated by the National Cancer Institute Act and by the recent state acts the ground is well prepared for cancer legislation. We are in fact in the midst of an expanding program of cancer control by coöperative efforts. The outlook is promising. Research is clarifying and deepening our understanding of the nature of cancer. Success in treatment grows with the increase in the skill, experience, and equipment devoted to clinical cancer service in easily accessible places; and especially as education leads to earlier and earlier action on the part of the patient.

In most cases early diagnosis and adequate treatment cannot be obtained by the unaided effort of the patient. Self-supporting people of moderate means need help in cancer as well as the wholly dependent. The immediate objective always must be to do the best that can be done at the time for every cancer patient no matter what his means or the stage of his cancer.

It is a notable fact that in some localities modern cancer service is now within fairly easy reach of all classes, but it is distressing how little has been

* *Pub. Health Rep.*, 53:2121, 1938.

done in so many other places to provide such service, in comparison with what could be done by better organization. It would be easy to spot such areas of deficiency in cancer facilities even in states with official programs. The lag between the acquisition of useful knowledge and its practical use is illustrated strikingly by the widely varying degrees to which adequate cancer service is available in different parts of the country. Enormous shortcomings exist as shown by the amount of accessible cancer that slips through into the incurable stage. Here are needs that cannot be met except by the organized coöperative action of various public and private agencies.

War and Nutrition

MORE than ever before, the current conflict is a war of starvation. You and I know that the mass health of people is impaired by inadequate diets. Even in our own countries which are at peace, adequate nutrition of the masses is one of our most important health problems. We cannot help but view with alarm the effects upon a whole generation of this present war of starvation. To illustrate the importance which the nations at war attach to this matter, I can tell you that in each of the warring nations any publication of results of new researches in the nutritional field is prohibited during the duration of the conflict.

Added knowledge of nutrition is a military secret, being considered a potential weapon in the hands of the enemy.—Dr. Thomas Parran, in an address at the Opening Session of the Fourth Pan-American Conference of National Directors of Health, May 1, 1940.

The Foundry Dust Hazard and Its Control*

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IN the present paper a small foundry viewpoint may creep into the discussion, but that is fitting inasmuch as recent studies [1, 2, 3] in several states have revealed that a majority of the plants employ less than 100 workers. Therefore, as regards the problem of the foundry dust hazard and its control in the industry generally, it is to the category of relatively small plants that much of the labor of governmental and private industrial hygienists must be directed.

RESULTS OF PREVIOUS STUDIES

As with any hygienic dust hazard, the pathology developing as a result of occupational exposures is largely confined to the respiratory system although some investigators have not lost sight of other ills that may be traced to foundry dust. Inasmuch as siliceous materials are employed extensively, it is logical that an evaluation of the extent of the dust hazard be based primarily upon the incidence of silicosis.

Although many studies have been made in recent years, two stand out as being representative of the industry generally. These studies represent a wide distribution of plants as to size, and the results obtained are based upon the examination of all employees rather than of a selected group of workers. These two studies reveal incidence rates for silicosis that are in remarkably close agreement. In New York State [4] and in North Carolina [5] only 2.7 per cent and 1.5 per cent respectively, of all foundry workers were found to have silicosis. In New York, the rate given is for all types of foundries. Steel foundries have a slightly higher rate. The iron foundries have very nearly the same rate as that for all types and are thus comparable with the North Carolina data, which represent iron foundries exclusively. The technic differed in that only x-ray examinations were made in New York, whereas both clinical and x-ray examinations were made in North Carolina. Other studies [6, 7, 8] have revealed that from 7 to 30 per cent of the workers examined had silicosis, but such results are based, not upon entire foundry populations, but upon the examination of only a portion of the workers. Greenburg [9] found that the incidence of silicosis for molding, grinding, chipping, tumbling, and abrasive blast cleaning ranged from 3.1 per cent for tumbling to 4.8 per cent for chipping.

The several investigations referred to reveal that foundrymen seldom suffer from the advanced stages of the disease.

* Read before the Industrial Hygiene Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 20, 1939.

Thus, the Metropolitan Life Insurance Company,[8] Sander,[6] and Greenburg and his coworkers[4] disclosed that 94.5, 91.4, and 80 per cent of the silicotics encountered in the respective groups exhibited first stage, or simple, silicosis. In North Carolina[5] none of the cases discovered had progressed beyond the initial stage. The low incidence of advanced pathology among silicotic foundrymen is heartening in that simple silicosis, the most prevalent stage of the disease, is not disabling[11] and is only slowly progressive.[12]

Parenthetically, it is pertinent to state that the discoveries and experiences of the past few years with respect to the extent of the foundry dust hazard have been reflected in progressive premium reductions for specific occupational disease loadings in workmen's compensation insurance rates. Thus, in 1936 the specific occupational disease loading was $3 for $100 of payroll; in 1937 it was $2.13; and in October, 1938, it was still further reduced to $1.29. These figures indicate an ever decreasing appraisal of the extent of the risk to health involved.[44]

The length of time required for silicosis to develop varies considerably. In North Carolina[5] all cases, with one exception, developed only after an exposure of 30 years. Greenburg,[14] found silicosis among workers in every exposure classification beyond 2 years but reports the majority as representing exposures in excess of 30 years.

The incidence of silicosis does not tell the whole story. All the investigations cited revealed that many of the foundry workers diagnosed as essentially negative with respect to silicosis exhibited increased pulmonary fibrosis. Thus, in New York,[15] 4.5 per cent and in North Carolina,[16] 8.2 per cent of the men examined exhibited marked exaggeration of the normal lung markings. Sander[6] reports that 71 per cent of the cases reviewed showed more pulmonary fibrosis than usual. In North Carolina fibrosis was found among workers with less than 10 years' exposure, and in New York the condition was most prevalent among men employed from 20 to 24 years. The incidence of fibrosis suggests that long before the development of well defined silicosis the inhalation of dust results in lung changes that are evident upon x-ray examination. This incipient dust pathology increases in significance when certain morbidity and mortality data are reviewed.

McConnell and Fehnel[17] cite statistical studies which revealed the death rate for respiratory diseases among iron and steel workers to be about 2⅓ times that in all industries combined and that more deaths resulted from pneumonia than from any other cause. A similar situation was found for brass and bronze foundry workers except that the rates in general were higher than for iron workers, and deaths from tuberculosis were more numerous than from pneumonia. British statistics[18] confirm such American findings. Britten[19] found bronchitis prominent among foundry workers with 10 years or more of service.

Jones[20] states that the incidence of pulmonary tuberculosis is highest among the workers in the siliceous industries, and Gardner[21] and others[22] have found with experimental animals that silica increases susceptibility to tuberculosis. Sander[12] concludes, based upon serial observations, that silico-tuberculosis is primarily a reactivation of previously acquired, but walled off, tuberculosis and that his studies suggest that the tuberculosis rate is not raised by dust exposure, *per se*, but rises only after silicosis becomes definitely established. On the other hand, Brumfiel and Gardner[23] state that "advanced silico-tuberculosis is neither that of silicosis superimposed upon a preëxisting focus of tuberculosis nor the reverse. It appears more like a mixture of reactions to

both tubercle bacilli and to silica in the same area."

Among foundrymen the incidence of pulmonary tuberculosis varies. Thus, clinically significant tuberculosis complicated silicosis in only 2.6 per cent of the cases in Massachusetts,[24] only 13.6 per cent of the cases in New York,[25] and in 37 per cent of the cases in North Carolina.[16] The Metropolitan study [8] disclosed only 1 case complicating silicosis. Sander [12] found that 22 per cent of the silicotics, however, had definitely active cases. Only 1 of the 45 North Carolina foundrymen exhibiting fibrosis had tuberculosis.

With respect to healed primary tuberculosis, 4 such North Carolina cases [16] displayed no evidence of dust pathology after exposures ranging from 21 to 38 years. Moreover, 2 workers who had been in the industry for 37 and 48 years, respectively, exhibited apparently healed pulmonary tuberculosis but no dust pathology. Greenburg [25] observed a similar situation.

In addition to respiratory afflictions, exposure to high concentrations of dust may lead to other disorders. Britten [26] points out with respect to the foundry industry that an important factor in impaired hearing is the physical character of the dust, which causes a large number of cases of impacted wax.

It is evident at present that the hazards to health attending exposure to foundry dusts are not confined to the much publicized silicosis and complicating tuberculosis but include, as well, a great many of the respiratory diseases. Occasional absence, therefore, of well defined silicosis among workers in a foundry not equipped with dust control safeguards should not be accepted as indicating the nonexistence of a dust hazard.

An average dust concentration of 15 million particles per cu. ft. of air is considered non-hazardous in New York State [27] while in North Carolina a threshold limit of 12 M.P. is accepted.

DUST SOURCES IN THE FOUNDRY

An examination of foundry operations reveals the most flagrant sources of dust to be mechanical sand conditioning, casting shakeout, and casting cleaning.

Molding, *per se*, does not generate excessive dust, except perhaps where compressed air is used for blowing off molds or where a sand slinger is used. Gray [28] reports an exposure of 32 M.P. for this type of work. In some small North Carolina foundries molding exposures, when uncomplicated by dust from other sources, range from 1 to 12 M.P. Gray [29] corroborates such results, as do Hatch and his associates.[30] Yet, in some plants the dust exposure of molders occasionally exceeds 200 M.P. Such excessive dust concentrations may be traced to other operations, most often to some form of casting cleaning —here employed broadly to include shake-out, core removal, sprue cutting, grinding, bristle brush cleaning, and abrasive blasting. Occasionally casting cleaning, for example, and molding will be carried on concurrently in the same workroom. Particle counts on samples of dust collected in such plants occasionally have revealed almost identical concentrations in casting cleaning and molding areas, indicating a drift of atmospheric pollution from one department to another with no diminution in concentration.

It is unlikely that the conditioning of sand on the molding floors is ever attended by the generation of harmful concentrations of dust, as the sand is always dampened thoroughly prior to working. Dust counts have revealed an average concentration of 4.6 M.P. for machine sand-cutting and 13.8 for hand sand-cutting.[31] The mechanical conveying of sand and its conditioning in machines, however, may be responsible for a high atmospheric dust concentration in the molding room. Gray [32, 33] reports dust concentrations of the order of 40 M.P. in the vicinity of mechanical

sand conditioning equipment. And, the Metropolitan study [34] revealed for sand conditioning operations dust concentrations exceeding 100 M.P. and one as great as 527 M.P.

Core making and metal pouring do not generate hazardous concentrations of dust; generally excessive exposures in this work indicate the existence of nearby dusty operations.

All phases of casting cleaning, when performed without adequate control measures, produce hazardous amounts of dust. The exposure in shaking out castings frequently exceeds 20 M.P.[35, 36] and in many plants daily exceeds 200 M.P.[37] Core removal, arbor pulling, and grinding may be equally dusty. Tumbling, when unexhausted machines are employed, may generate as much as 250 M.P. of dust. Sand-blasting is attended by flagrant dust exposures in many plants. For example, a workman has been observed sand-blasting small machine parts with only a handkerchief across his face in an atmosphere containing more than 200 M.P of dust per cu. ft. of air. Either of the frequently observed practices of sand-blasting in the plant yard or in a poorly constructed room may be responsible for an increase in the dust exposure of other workers.

CONTROL OF THE DUST HAZARD IN THE FOUNDRY INDUSTRY

With respect to the control of the dust hazard in foundries, good housekeeping is a relatively simple and inexpensive expedient, and yet it is most effective. Hatch [1] has demonstrated in a unique manner that the atmospheric condition and the incidence of silicosis are definitely related to both good housekeeping and plant activity.

The chief factors in a good housekeeping program are the maintenance of enclosures in a good state of repair; the removal from the workroom to storage of all unnecessary equipment; keeping floors free of accumulations; keeping floors damp; the frequent removal of dust deposits from structural members, exposed pipes, and machinery; the removal of grime from window lights; and the frequent cleaning of walls. In this connection, the safety engineer of one large plant [38] states that a concrete floor aids materially in keeping a plant clean, while the superintendent of another large foundry [39] concurs in this view, adding that white walls and the vacuum cleaning of floors are assets. He bans brooms and adds, "It is our belief that dust suppression is equally as essential as dust collection." Gray [40] reports that the introduction of good housekeeping practices in one foundry resulted in a reduction of dust from a high of 125 M.P. to 8.0 M.P.

Good natural ventilation is a valuable asset in the control of dust. Roof ventilators should be provided in every foundry building. The monitor top type roof is especially recommended.

Although good housekeeping is an important part of a dust control program, nothing short of exhaust ventilation will completely eliminate the occupational disease hazard attending the shake-out, core removal, arbor pulling, tumbling, grinding, sand-blasting, and sand conditioning in mechanical equipment.

In North Carolina [41] the exhaust ventilation of grinding wheels and tumbling mills has been found to effect a 94 per cent reduction in the dust exposure of the operators. These two operations, together with casting shake-out, are the principal sources of dust in the small foundry; however, due to the character of the dust, the shake-out exposure in equal concentrations is not as hazardous as the others.[42] The shake-out exposure in the small plants must be controlled partially by good housekeeping.

The modern mechanized foundry is most amenable to the control of dust

by exhaust ventilation. In such plants flask dumping mechanisms, the rotary shake-outs, the tumbling mills, the grinding wheels, and the sand conditioning system all may be readily ventilated, with resulting complete control of the dust hazard.

In summary, the essential factors in the control of foundry dust are: (1) good housekeeping, (2) exhaust ventilation, (3) tight enclosures, (4) isolation of some processes (swing grinders, for example, where they are not exhausted), (5) substitution, where practicable, of steel shot for sand in abrasive cleaning, (6) the dampening of floors, (7) the use of respirators for exposures of short duration, (8) the use of positive pressure air helmets for sand-blasting and swing grinding where the latter are not exhausted, and (9) the proper maintenance of equipment. To these essential factors should be added preëmployment examinations and periodic inspection by governmental and other agencies. Such inspections appear to be most helpful with respect to small establishments that frequently have little contact with other plants in the industry. The official visitor is often the only person to commend or exhibit any interest whatever in a dust control program.

CASH VALUE OF A DUST CONTROL PROGRAM

With respect to the dollar and cents value of a dust control program, one foundry official[38] states with respect to dust control that it has reduced costs approximately 10 per cent and spoilage now is approximately only 1 per cent. Furthermore, the expenses of making the changes necessary were written off by savings effected in one year. An official of another foundry states,[43] "Improved production, savings in lighting, and increased salvage, no less than improvement in the health and morale of workmen, are the advantages we have obtained from our extensive installation of dust control and dust collecting apparatus. Nevertheless, had there been no savings in money, we would have been satisfied in the knowledge that we had done something merely humane in protecting the men who work for us. In improving their health we only follow the wisest policy in industrial management, the policy of constant betterment of every phase of production which alone can maintain progress in quality and plant output."

In practically all states a monetary reward in the form of reduced premiums for specific occupational disease compensation insurance may be realized by the installation of dust control equipment and the institution of good housekeeping practices. The maximum premium credit is 35 per cent, which may be earned in accordance with the following rating schedule:

	Per cent
Casting cleaning	9
Shake-out	5
Molding process	3
Sand conditioning	3
Housekeeping	5

The total of such credits is 25 per cent, but a bonus of 10 per cent is given for the compliance with *all* standards; thus, a premium credit of 35 per cent is possible. In 1937 in North Carolina there were 9 foundry risks, of 16 inspected, that received credits under the schedule rating plan; in 1938 there were 16 foundry risks, of 17 inspected, that received such credits. In the latter year the credits ranged from 3 to 35 per cent of the foundry loading, that is, the premium charged per $100 payroll. The average credit earned during the year 1938 was 7.9 per cent; however, several foundries qualified for the maximum credit.[44]

Thus, there accrue as a result of the installation of dust control measures many benefits that may be appraised in terms of dollars and cents savings.

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Some Statistical Needs for Proper Administration of Maternal and Child Health Programs*

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THE physicians administering the maternal and child health aspects of public health programs, and other physicians interested in this work must seek from the vital statisticians some of the tools with which they work. These tools include accurate statistical data. The vital statisticians have a real responsibility to the community in providing the service agencies with accurate information from which intelligent programs can be planned which will lead to a reduction in the mortality and morbidity of pregnancy and infancy.

Generally speaking, the statistical needs for maternal and child health programs can be divided into two groups: The vital statistics usually available in any state, and supplemental statistical information which is usually essential to proper interpretation of the basic vital statistics. Consideration is not given in this paper to statistics related to tabulation of services rendered individuals nor to progress reports. This paper will be limited also to consideration of statistics relating to the maternity and neonatal aspects of the maternal and child health program.

The vital statistics relating to maternity and early infancy which are usually available in any state, county, or large city, and which are a part of the basic information in planning any health services for mothers and infants, are as follows:

1. Live births and stillbirths (number and rate)
   a. Urban, rural
   b. Resident and nonresident
   c. In hospitals, in homes
   d. Attended by physician, not attended by physician
   e. Legitimate or illegitimate
   f. Race
2. Maternal deaths (number and rate)
   a. Urban, rural
   b. Resident and nonresident
   c. In hospitals, in homes
   d. Attended by physicians, not attended by physicians
   e. Causes
3. Neonatal deaths (infant deaths under 1 month of age)—number and rate
   a. Urban, rural
   b. Resident and nonresident
   c. In hospital, in homes
   d. Attended by physician, not attended by physician
   e. Race
   f. Causes of death
   g. Age at time of death

Ideally, a copy of the certificate for every live birth occurring in a home should be in the hands of the local health agency within 24 hours after the birth. The public health nursing serv-

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ice rendered in the home within the first 24 or 48 hours of a child's life will be more valuable than at any other period of his life.

Women who have been given public health nursing service during pregnancy and at time of delivery naturally receive this service, but they are a small percentage of the total. A large proportion of the women delivered at home in the United States are still not brought under public health nursing supervision until after the delivery, if then. We believe that the high infant mortality during the first 2 days of life can be reduced if proper nursing as well as medical supervision is given. Nursing assistance and instruction is especially needed for the prematurely born infants. Only in communities where the local health agency is currently informed of each birth in the area is this early postpartum nursing service possible.

Laws requiring the reporting of a premature birth within a few hours of the time of birth have in a few areas aided the public health agency to render immediate service to this large group of infants in need of special care.

In addition to the statistics now available on births by residence, it would seem desirable to have for each county or city in the United States data concerning (a) the number of residents delivered of live-born infants in the area; (b) the number of residents with live births in other areas; (c) the number of nonresidents with live births in the area. When many women resident in an area are delivered outside the area (or vice versa) it seriously affects the interpretation of birth rates for those areas. The Bureau of the Census is considering a new method of securing and reporting this type of information. I will refer to it again as it relates to maternal and infant mortality.

Concerning stillbirths there is much additional information needed. There still remains a lack of uniformity in state laws or regulations relating to the reporting of stillbirths. Until all of the states have adopted the same regulations we cannot hope to obtain comparable statistics. There is also a general lack of knowledge among physicians concerning the legal definition of a stillbirth in their state. Information concerning causes of stillbirth is woefully inadequate. If all of the states adopt the new stillbirth certificate we may obtain extremely valuable data concerning the factors responsible for the death at or before birth of over 70,000 infants each year. The International Committee on Causes of Death last year recommended a new classification for causes of stillbirths. If the new stillbirth certificates are adopted in all states, and if physicians will endeavor to complete them as accurately as possible, we will be able to classify this group of deaths by causes, and we hope that before the next international meeting the United States will have sufficient information regarding the etiology of stillbirths to offer further suggestions for the classification of this group of deaths. The information from the new stillbirth certificates will also assist us in planning measures which may prevent many of these deaths in the future.

The present classification of causes of infant deaths is recognized by all countries as unsatisfactory. Under such indefinite causes as "congenital debility" or "prematurity" or "other diseases of early infancy," are classified more than 40,000 infant deaths each year for which much more accurate data are needed if we are to plan intelligently how to prevent as many of these deaths as possible. We hope that several states will study neonatal deaths with one of the objectives in mind to outline a more satisfactory classification for this group of infant deaths.

The excellent statistical material we have had over a long period of years relating to maternal mortality has en-

abled physicians to study this group of deaths more closely than those from almost any other cause. The comprehensive maternal, stillbirth, and neonatal studies made by groups of physicians in several cities and a few states in recent years have been possible only when there is the closest coöperation between the medical group making the study and the local vital statisticians. Examination of maternal death certificate alone gave the public health administrators and obstetricians insufficient information for determining whether the death was preventable. Cause of death alone was not sufficient. If it was a maternal death, what were the complications of pregnancy and labor that might have been responsible? A death certificate stating the cause of death as "puerperal sepsis" means very little, but add the information that pregnancy and labor were complicated by contracted pelvis and a 3 day labor followed by cesarean section, and that the patient lived in a rural area 50 miles from a hospital, and we can determine whether similar deaths can be prevented in the future. Many neonatal deaths are certified as being due to "prematurity." This information becomes more valuable if we learn that pregnancy was complicated by a toxemia and that the patient did not receive prenatal care. Mortality records become very valuable when additional information relating to each death can be obtained and considered in relation to the economic status of the families in the areas and to the accessibility of medical, nursing, and hospital care. Communities which are able to obtain and study this type of information are in a position to plan measures which should reduce the number of avoidable deaths.

It is generally agreed that the studies which have been made and published have had a profound influence in at least four directions: (1) They have brought to the attention of the communities the underlying factors responsible for many of these deaths, such as ignorance of the patient or lack of facilities for medical and hospital care for maternity patients and infants. (2) They have impressed forcefully upon the physicians the fact that a certain proportion of these deaths are the result of lack of knowledge on the part of the attending physician. (3) They have often given us new knowledge of the measures that can be taken to prevent many of these deaths in the future. (4) They have in practically every instance shown the vital statisticians that inaccurate causes of death are often entered on death certificates and have made it urgent for them to seek ways and means of securing more accurate and more complete information. They have also pointed out the incompleteness of the registration of live births and stillbirths.

From the combined conclusions of many of these studies, the Children's Bureau, in coöperation with the Bureau of the Census, recommended revised birth and death certificates so that not only physicians and public health administrators but also the statisticians will be provided with more complete information for use in their own community and with comparable statistics from other communities. There are several items on the revised death and birth certificates which warrant special mention.

On the standard death certificate under "Other conditions causing death," there is a parenthetical note (Include pregnancy within 3 months of death). It is hoped that this note will call to the attention of the attending physician the importance of mentioning pregnancy, whether or not it was directly related to the death. Careful review in some cities of all death certificates of women between the ages of 15 and 45 has shown that in many instances sepsis is

given as the cause of death, and pregnancy is not mentioned, even though the death was caused by puerperal sepsis. Sometimes as many as one-fourth of all maternal deaths are recorded under "other causes" because of failure to mention pregnancy on the death certificate.

The supplemental information requested for inclusion on all live birth certificates includes the following:

Complications of pregnancy .....
Complications of labor .....
Was there an operation for delivery .....
State all operations .....

Forty per cent of the new state birth certificates received by the Bureau of the Census from the states up to September 20, 1939, included this supplemental material. Note that these same questions are also on the stillbirth certificates.

In several states failure to adopt the entire new birth certificates has been due to the objections of vital statisticians. I believe that if they had fully appreciated the value of the additional information requested it might have outweighed their justifiable criticism. The greatest value of the new information obtained by the states adopting these certificates completely will be to give us for the first time the relative importance of certain complications of pregnancy and labor as they relate to live-born infants that remain alive, to live-born infants that die in the neonatal period, and to stillborn infants. For example, for 100,000 live births we may have 10,000, or 1 in 10, certificates which will indicate toxemia of pregnancy as a complication. If a study of neonatal deaths shows that one-half of their live birth certificates show toxemias of pregnancy as a complication, it will give us some idea of the importance of toxemias of pregnancy to the neonatal death rate. During this same period the certificates for 10,000 stillbirths may show an incidence of 50 per cent with toxemia as a complication of pregnancy. The relationship between serious complications of pregnancy and labor and the causes of maternal, stillbirth, and neonatal death rates, have never been carefully studied. There is every reason to believe that the information obtained from these certificates, if carefully studied and used, will pave the way for many valuable preventive health measures.

We have recently asked the Bureau of the Census to make available annual maternal and infant mortality rates in relation to residence. Further data relating to deaths of mothers or infants resident in one area who are delivered or died in other areas as nonresidents, if wisely interpreted, will be important in evaluating the adequacy of existing facilities for the care of these patients.

Information concerning the relationship between neonatal mortality and the period of pregnancy when the birth occurred, can now be obtained by matching birth and death certificates. The matching of maternal death certificates with birth certificates (if a birth occurred) can also give us much needed information regarding the relationship between causes of maternal mortality and the period of pregnancy. Measures instituted to prevent mortality in the early months of pregnancy must often be quite different from those for preventing mortality in the latter months of pregnancy.

It would also seem desirable to have in each state statistics concerning the deaths of *all* women who were pregnant at the time of death, or who had been pregnant within 3 months of death. This would mean tabulating both the deaths assigned to puerperal causes and the deaths associated with pregnancy which were assigned to nonpuerperal causes. More knowledge is needed about the rôle pregnancy plays in causing many deaths now assigned to heart disease, chronic nephritis, and other

conditions which might not have caused death if pregnancy had not occurred.

Further analysis should be made of maternal, neonatal, and stillbirth mortality in relation to the type and size of hospital where death occurred. A study in Ohio in 1938 showed that maternal mortality in small hospitals was more than 4 times as great as in the large hospitals approved by the American Medical Association for internship. State-wide studies of this type, if carefully interpreted, might lead to important conclusions relative to the facilities for proper care of maternity patients and infants in these hospitals.

The U. S. Bureau of the Census has reported that 38.5 per cent of all maternal deaths occur at home. Does this indicate that these women were unable to obtain hospital care because of economic status or lack of hospital facilities, or are there other explanations? A study of maternal deaths occurring at home should be made in relation to cause of death and location.

Vital statisticians and registrars occasionally ask why there is so much interest in maternal, infant, and stillbirth mortality when there are so many deaths from other causes. As a matter of fact, these deaths account for approximately 14 per cent of all deaths in the United States each year, and actually total more than the combined deaths from all communicable diseases. Not only is the total great, but it constitutes a loss of life largely unnecessary and of profound social and economic importance. In each state there is a director of maternal and child health who is responsible for the administration of the maternal and child health program. We have repeatedly encouraged these physicians to coöperate with the vital statisticians in their states in obtaining information essential in the development of the maternal and child health program. In turn, I ask you as vital statisticians to inform the maternal and child health director of the statistics you have available for his use. Perhaps at times you will find that there is much additional information which could be readily obtained by your department which would be extremely valuable to maternal and child health divisions.

Evaluating the Health Education Program of a Health Department*

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THE following questions and criteria for judging the effectiveness of the health education program in a health department are based on proposals which have been suggested in the literature (See Bibliography) and on the experience of surveying the health education activities of the Detroit Health Department in the summer of 1938.

The criteria have been divided into two sections. Section one includes proposals for evaluating the activities of the health education division. They are criteria which apply to the principal educational efforts of health departments.

Section two includes the criteria for evaluating the health education activities of the other bureaus or divisions whose principal functions are in some other technical field of public health.

Criteria for evaluating the health education activities of the school are not included. Such suggested standards may be found in the literature.[2, 13, 14, 18, 20, 29, 31]

1. CRITERIA FOR EVALUATING THE ACTIVITIES OF THE HEALTH EDUCATION DIVISION

1. Are the objectives sound and adequate in promoting a knowledge of, and favorable attitude toward:
   a. The health department activities?
   b. The maintenance of physical and mental efficiency?
   c. The adequate utilization of the services of the private physician?
2. Are the principles underlying the educational program effective in that:
   a. The coöperation of organized medicine is secured.
   b. Education of the physician precedes public education with respect to new public health activities.
   c. The opportunity is given to community leaders to participate in planning and conducting health education activities.
   d. Measures and activities possible of accomplishment are proposed.
   e. The educational program is planned to reach as many members of the family as possible.
3. Is the instructional material:
   a. Accurate?
   b. Based on a study of community needs?
   c. Adjusted to the economic, racial, religious and intellectual status of the group reached?
   d. Presented at the psychological time?
4. Does the educational program reach:
   a. The health department staff?
   b. The medical profession and allied professions?
   c. Leaders in the community?
   d. The public at large?
   e. School groups?
   f. People needing special health advice, such as food handlers?

* Read at a Joint Session of the Health Officers and Public Health Education Sections of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 17, 1939.

5. Does the educational program utilize a sufficient variety of educational methods including:
   a. Individual instruction by physicians, nurses, inspectors and other professional workers?
   b. Group conferences?
   c. Talks or lectures?
   d. Radio programs (lecture, interview or drama)?
   e. Written material including:
      (1) Newspaper publicity (news stories, editorials, "filler," special supplements)?
      (2) Pamphlets?
      (3) Letters (personal letters, form letters)?
      (4) Cards?
      (5) Handbills or flyers?
   f. Visual material including:
      (1) Stereopticon slides?
      (2) Moving pictures?
      (3) Exhibits?
      (4) Bill boards?
6. Are important educational media utilized to a sufficient degree to comply with the American Public Health Association standards which appear in the following chart?

CHART

QUANTITATIVE STANDARDS FOR THE UTILIZATION OF CERTAIN EDUCATIONAL MEDIA *During One Year* AS ESTABLISHED IN THE AMERICAN PUBLIC HEALTH *Appraisal Form for Local Health Work*, 1938

Division or Bureau	*Pamphlets or Letters*	*Newspaper Publicity*	*Lectures, Talks, Motion Pictures*
Acute Communicable Disease	Two pamphlets to be distributed per case of typhoid fever, measles, scarlet fever, whooping cough, diphtheria, reported	News articles in the local newspapers for each of the five numerically most important communicable diseases	
Syphilis and Gonorrhea	Three pamphlets to be distributed per case reported	Items in local newspapers at least 3 times	Attendance at meetings to be equal to 4% of total population
Tuberculosis	Three pamphlets to be distributed per case reported	Items in local newspapers at least 3 times	
Maternity Hygiene	One pamphlet or series of letters to be distributed per birth reported		Classes reaching 50% of antepartum cases carried for nursing service
Infant and Preschool Hygiene	One pamphlet to be distributed for each live birth and preschool child	One comprehensive article or two briefer articles in local newspapers	
General Sanitation	Pamphlets to be available for general distribution covering 4 major topics	Items in local newspapers	
Food and Milk Control	Pamphlets to be available for general distribution covering 6 major topics	Items in local newspaper at least once	

7. Does the director of health education possess suitable educational qualifications * (or extensive experience)?

2. CRITERIA FOR EVALUATING THE HEALTH EDUCATION ACTIVITIES OF THE BUREAUS OR DIVISIONS WHOSE PRINCIPAL FUNCTIONS ARE IN SOME TECHNICAL FIELD OTHER THAN HEALTH EDUCATION

A. *Criteria which may be applied to all bureaus or divisions*

1. Are the findings of the division made available to other professional workers to whom they may be useful such as:
   a. The director of health education?
   b. Workers in other bureaus or divisions of the health department?
   c. Physicians and dentists?
   d. Public and private health agencies?
2. Are the findings of the bureau presented in such a form as to be useable and understandable?
3. Are the activities of the division available to professional workers for inspection and study?
4. Is there in-service training for staff members through:
   a. Staff meetings?
   b. Printed material such as reports of new findings in administration and research?
   c. Refresher courses?

B. *Criteria which apply to bureaus and divisions which operate clinics and carry on home visiting*

1. Is there an administrative policy which expects the patient to be advised and instructed by the physician and allows sufficient time for such education?
2. Is there individual nursing instruction touching the care of the patient in the home, and instruction in nutrition to assist in carrying out food treatment, as a part of medical treatment, for patients requiring it?
3. Is there group medical and nutritional education provided for patients when this is feasible?
4. Does the patient's record provide space to indicate the health instruction given?
5. Are posters, pictures and exhibits used in clinic waiting rooms as methods of educating the patients?
6. Is printed material available for distribution where such material would be helpful?
7. Do the public health nutritionists and nurses who carry on this program meet the educational qualifications set by their respective associations? * †
8. Is there sufficient nursing staff (15–20 per 100,000 population) to carry out the educational program which should be contributed through public health nursing?
9. Are nursing visits provided to a sufficient degree for communicable diseases, tuberculosis, maternity, infant and preschool hygiene to comply with the American Public Health Association standards? [2]

C. *Criteria which apply to bureaus and divisions using inspectors in the field*

1. Is it departmental policy to utilize education methods rather than legal authority in securing adherence to rules and procedures recommended by the health department?
2. Is the public informed concerning the sanitary standards of the health department through:
   a. Posted notices?
   b. Copies of sanitary regulations sent to persons concerned?
3. Have the sanitarians or field workers sound factual training for their work, and the ability to impart the necessary knowledge? [15]

* The American Public Health Association through its Committee on Professional Education recommends a planned program for undergraduate work followed by at least 1 year of graduate study in health sciences and in methods and materials of public health education.

* A joint committee of the American Dietetic Association and the American Home Economics Association recommends a planned program for undergraduate work followed by graduate study and experience.[11]

† The American Public Health Association through its Committee on Professional Education recommends educational qualifications for public health nurses which are approved by the National Organization for Public Health Nursing and by the Governing Council of the American Public Health Association.[12]

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Genetic Constitution in the Rabbit and Antibody Production*

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IT is not a new observation that wide variation in immunologic response may occur among several animals inoculated with the same antigen. Several explanations for the variations have been proposed, and it seems certain that age, the physiological condition of the animal as influenced by diet and living conditions, and inherited characteristics, are factors influencing immunization. For example, it is common laboratory experience that two or three rabbits should be immunized to be sure of obtaining a precipitin serum sufficiently potent for forensic tests. For the production of diphtheria antitoxin certain horses which have slight normal antitoxin are more suitable than others.

In the case of immunization of rabbits with human blood cells it was noticed that certain rabbits failed to respond to the injection of A cells, and the reason was shown by Witebsky[1] to be due to the presence of an A antigen in the tissues of these rabbits. This situation is similar to that for the human O, A, B, and AB blood groups, where the presence of antigen in the body tissues determines the absence of the corresponding antibody from the serum. Furthermore, rabbits lacking the A antigen possessed normal anti-A agglutinins in their sera.

In the course of some work at Brown University with the anti-human rabbit sera it was noticed that one stock of rabbits consistently yielded good titering immune specific anti-A agglutinins while other rabbits failed to do so. At the time, a good sized rabbit colony was being maintained for genetical work, and it was decided to test these animals for normal agglutinins for human blood cells of the various groups. Some 40 or more rabbits were immunized with A cells, and specific antibody formation was found to correlate with the presence of normal specific A agglutinins.[2] Among 9 inbred, or closely bred families in which the animals were distributed[3] one family was found in which the animals were all of one type—all possessed A agglutinins—and consequently could yield potent A antibodies after immunization.

The data suggested that the ability to immunize was inherited, and possibly in a simple Mendelian fashion. Subsequently, a few cases have been found in which atypical, and for the most part temporary, A agglutinins were present. These were unlike the usual normal agglutinins and occurred even when an A antigen was present in the rabbit tissues. Breeding tests were carried

* Prepared to be read before the Laboratory Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 19, 1939.

out, in conjunction with other genetical work, to determine the mechanism of inheritance of the ability to yield strong anti-A agglutinins (as indicated by the presence of normal A agglutinins, or by the absence of A antigen in the rabbit serum shown by a negative complement-fixation test with the appropriate antiserum). Good evidence for inheritance was found.[4] Results of the breeding tests to date are summarized in Table 1.

TABLE 1

Inheritance of the A Character

Genotype	*Normal Agglutinin*	*Immunizing Capacity*
A_nA_n	absent	—
A_na_n	absent	—
a_na_n	present	+

Type of Mating	*Type of Progeny*	*Number of Progeny*	*Expected Ratio*	*Chi Square*
$\frac{A_n}{A_n} \times \frac{A_n}{A_n}$ or $\frac{A_n}{a_n}$	A_n	30	30	
	a_n	0	0	
$\frac{A_n}{a_n} \times \frac{A_n}{a_n}$	A_n	205	209.2	0.22
	a_n	74	69.8	
$\frac{A_n}{a_n} \times \frac{a_n}{a_n}$	A_n	208	219	1.10
	a_n	231	219	
$\frac{a_n}{a_n} \times \frac{a_n}{a_n}$ *	A_n	0	0	
	a_n	225	225	

* This mating includes 150 animals in Family I.

The mechanism of inheritance is illustrated at the top of the table; A_n representing the dominant and a_n the recessive factor. Only the homozygous recessive animal possesses normal specific A agglutinins and can yield strong immune antibodies. The first type of mating involves parents, one or both of which may have been a homozygous dominant since no negative (lacking A agglutinins) offspring occurred. The double heterozygous mating gives a ratio of 205 to 74 which is close to the expected 3 to 1. The 439 animals in the backcross matings yielded 208 negative to 231 rabbits with A agglutinins—well within the chance variation from the 219 expected. From the homozygous recessive mating 225 progeny were obtained. This includes 150 rabbits which belong to the Family I strain, Family I being a pure recessive stock. The deviations of the experimental from the theoretical ratios, although within chance error, have always been toward an excess of alpha animals. The significance of this is uncertain. A rare exception from the expected type of offspring could be theoretically possible due to mutation.

In the case of the human group B blood cell antigen, the situation is different. The B factor is a multiple antigen,[5] a part of which occurs in the erythrocytes of all rabbits. Consequently upon injection, antibodies could be produced in rabbits only against the B components not in the rabbit cell. Immunizations have shown,[6] however, that although all rabbits possessing normal B antibodies produce immune agglutinins, some but

TABLE 2

Inheritance of the M character

Genotype	*Normal Agglutinin*	*Immunizing Capacity*
M M	absent	+
M m	absent	+
m m	absent	−

Type of Mating	*Type of Progeny*	*Number of Progeny*	*Expected Ratio*	*Chi Square*
M/M x M/M or M/m	M	13	13	
	m	0	0	
M/m x M/m	M	36	39.8	1.21
	m	17	13.2	
M/m x m/m	M	13	11.5	0.37
	m	10	11.5	

not all individuals without the agglutinins also produce immune B antibodies. Furthermore, B antibodies in general are less easily produced than A agglutinins. If immunizing capacity for the B antigen is inherited it apparently is not by a simple mechanism but probably by multiple factors.

Another serological characteristic was studied—the ability to produce anti-M agglutinating sera. Instances cited in the literature showed that about 30 per cent of the rabbits that were immunized yielded suitable M typing fluids. Injections of animals from our stock showed considerable variation in response to the M antigen. A further series showed that the immunizing capacity was inherited [7] and, so far as the data went, inheritance could again be explained by a single pair of factors.

Table 2 summarizes the breeding data to date for the M character. In no case are normal specific M agglutinins present in the rabbit sera. With the M antigen, in contrast to the A, the ability to produce antibodies is the dominant (M) factor and only the homozygous recessive animal (mm) is incapable of forming M agglutinins. Progeny have been tested from three types of matings and, although the numbers are not great because of the long procedure needed to test each animal, the figures closely approximate the expected ratios for a simple Mendelian interpretation of inheritance. No progeny from the double recessive mating have been available for testing.* While the ability to produce M agglutinins definitely seems to be an inherited characteristic in rabbits, no final conclusions can be drawn until the double recessive mating has been made and until larger numbers of progeny have been tested.

The reason for the failure to produce M antibodies is not apparent. M antigen has not been conclusively demonstrated in the tissues of rabbits. It is not in the erythrocytes,[8] and in the few cases which we have examined we have not found it in the tissues. A serious difficulty in working with M and N agglutinins is nonspecific absorption. This seems to be overcome by the new technic of Kosjakov and Tribulev,[9] and possibly by this method M antigen will be demonstrated in the tissues of rabbits which fail to yield M antibodies.

* Mr. Sleeper has several litters of young rabbits which should be ready for testing within a few months.

Besides these studies with the human blood cell antigens a few additional facts have been noted in connection with the stock of rabbits, particularly with respect to Family I which is a strain of New Zealand whites, large (8–10 lb.) white rabbits which was started in 1932 with 3 sibs and now has been closely bred for 7 generations. Fifteen of these animals were tested by Dr. Landsteiner at Rockefeller Institute and consistently found to give considerably higher titers for Forssman antibodies than the stock commonly used. Another interesting fact was observed in connection with immunizations done at Brown University with coliform organisms. Because of shortage of Family I rabbits discarded animals from genetic experiments were used for most immunizations. With one culture attempts to produce agglutinins in 6 animals failed; the maximum agglutinin titer was 1:160. One Family I rabbit was used and after a short course of injections gave an agglutinin titer of 20,000.

For several reasons no attempt has been made to extend the studies to other antigens, bacterial or otherwise, but it seems likely that, possibly with a strain of the present stock, or by selection of animals and breeding to bring out the characteristic, strains of rabbits could be had that were especially suitable for specific immunological purposes. The Family I animals, for example, are excellent for the production of anti-A agglutinins or heterogenetic antibodies against the human A- or sheep cell antigens. Possibly this, or another strain would also prove particularly good for anti-pneumococcus sera, or antisera against the enteric organisms.

That the individuality of the rabbit is a factor in both the qualitative and quantitative aspects of antibody production should be borne in mind. While many factors such as length of immunization, route of injection, age and physical condition of the animal, etc., influence the reactive qualities of the serum produced, especially when complex cellular antigens are used, the "constitutionality" of the rabbit is important, and sometimes critical. We have shown that some of the "constitutional attributes" of the animal are inherited and probably in simple Mendelian fashion. Other serological characteristics also seem to be inherited although the manner of inheritance, at present, is not so apparent.

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Prevailing Employment Policies in Health Departments*

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WITH the recent expansion in public health, the importance of definite policies in personnel management is being better recognized, and the point has been reached at which such scientific methods of selection and control are regarded as integral parts of the structure. Thus health officers, as public health executives having an administrative goal of efficient service, have come to realize the necessity for having a high quality of personnel to render the service. Unfortunately, however, they have not thoroughly realized the degree to which they are responsible for selection of the best available employees. Administrative policy is not only a primary factor in securing good employees, but it will go far toward shaping the attitudes and, to that extent, the efficiency of those in service.

Realizing this fact, the Conference of State and Territorial Health Officers requested the Public Health Service to assemble data on existing policies and methods of personnel handling in official health departments. Accordingly, in July 1938, the Public Health Service sent out a detailed questionnaire to each official state or city health department known to be in charge of a full-time executive. The purpose of this paper is to present an analysis of the data thus assembled.

SCOPE OF THE STUDY

The questionnaire requested details on the policies governing professional, scientific, and technical personnel with special reference to: (1) merit systems, (2) selection of prospective employees, (3) bases for promotion, (4) existence (and range) of graded salary scales, (5) retirement systems, and (6) annual leave, furloughs, and sick leave. Questionnaires were sent to 52 state and territorial health departments and 50 replies were received.† The response from cities was less complete; 50 of the 276 schedules sent out to cities having a population of 10,000 or over were not returned and an additional 23 incomplete replies were omitted from the analysis. The discussion that follows is based, therefore, on data from 46 states, the District of Columbia (herein treated as a state), and 203 cities.

MERIT SYSTEMS

Since a merit system is generally accepted as a most effective device to

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† Although replies were received from the territorial departments, they are not analyzed in this report, because of lack of comparability with states.

avoid the outstanding evils of the spoils system, the schedules from both state and city health departments were first considered according to the reported presence or absence of such a system in the department. In this study a health department is credited with a merit system if any full-time employee, paid directly from the department's funds, is employed on a merit basis.

TABLE 1

Proportion of Employees under a Merit System in Health Departments, Distributed According to Jurisdiction

Proportion of Employees Reported under Merit System	*Jurisdiction*			
	State		*City*	
	No.	*Per cent*	*No.*	*Per cent*
All or some part	18	38.3	126	62.1
All	2	4.3	65	32.0
All except H. O.	11	23.4	29	14.3
Part, excluding classes or individuals	5	10.6	32	15.8
None	29	61.7	77	37.9
Total	47	100.0	203	100.0

In Table 1 it is seen that three-eighths of the state departments and five-eighths of the city health departments operate under some form of merit program, although in only 2 states, and fewer than one-third of the cities, are all personnel in the department affected. While no one would call this an impressive showing, it does indicate the extent to which the policy of having all personnel under merit regulation has been adopted.

It should be pointed out that one-third of both the state and the city departments reporting merit programs omit one or more groups or individual employees from the regulations and that the health officer is specifically exempted alone in 11 states and one-seventh of all the cities. Investigation of the group of departments with merit systems that leave out employees other than the health officer, however, reveals no consistent pattern of exemption. In some jurisdictions several types of employees are left out of the system; in others, only one. For example, among jurisdictions claiming merit systems, 1 out of 6 exempts all or part of its full-time staff physicians; 1 in 12, nurses; 1 in 10, nursing supervisors.

Though the merit system is accepted as the means by which a career service for public personnel can be maintained, the data indicate that much remains to be done before public health can point to a career personnel employed on a merit basis.

PERSONNEL SELECTION

Not only is selection of competent employees a primary function of good personnel administration; but the quality of employees selected determines the future efficiency of the health organization. Lacking capable personnel, no amount of administrative ingenuity can produce effective service; but with high caliber personnel the lightened routine load increases the executive's opportunity for leadership.

What methods are used to select employees? It should be borne in mind that, inasmuch as a given department may use more than one method or a combination of several selection devices for different types of personnel, there is no clear-cut way of grouping jurisdictions in mutually exclusive single categories. However, it has been pos-

sible to set up classifications into which departments fit according to the degree of freedom from partisanship afforded by the devices or methods they use to choose new employees. Each department having known methods of personnel selection may be classified according to the following categories of requirements for employment: (a) examination regardless of other requirements, (b) eligibility on a list but no examination, (c) specified qualifications as to experience and training but no examination or eligible list, (d) recommendations only or recommendations and interview, and (e) only an interview.

Table 2 distributes departments according to these categories and shows the breakdowns by jurisdiction and presence or absence of a merit system. One-third of the states and more than half the cities report that some part of the health department staff is selected by examination, the most prevalent of all the devices listed. The data, on more detailed analysis, however, showed only one-fifth of the states and one-third of the cities as using this method for all employees even if the health administrator is left out of consideration entirely. Although the technic of examination enters most frequently into the process of selection, almost the same number of states and half the number of cities that use this method depend solely upon an interview for such selection as they make.

Less widely used is the procedure of interviewing those on an established list of eligibles. Next to the examination, this is perhaps the method allowing least opportunity for partisan politics or personal favoritism, provided the preparation of the eligible list is adequately protected. Our data furnished no evidence on this point. Small groups of jurisdictions require (a) specified qualifications as to education and training (such as the minimum standard set up by the State and Territorial Health Officers); or (b) references or recommendations from former schools, former employers, state medical associations, nursing societies, state health departments, or reputable citizens. The latter requirement occurs most frequently among city departments without merit systems and is open to the objection that, while it may offer some protection against selection of incompetent personnel, it also furnishes opportunity for the exertion of political pressure.

TABLE 2

Methods of Personnel Selection in Health Departments, by Jurisdiction and Existence of Merit System

Method of Personnel Selection	Total Departments Reporting		Health Departments According to Jurisdiction: State		Jurisdiction: City		Merit System: With		Merit System: Without	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Examination, required for all or part of employees	121	48.4	15	31.9	106	52.2	117	81.2	4	3.8
Interview, eligible list	15	6.0	5	10.6	10	4.9	4	2.8	11	10.4
Specified qualifications required	14	5.6	7	14.9	7	3.5	1	0.7	13	12.2
Recommendation required	28	11.2	5	10.6	23	11.3	8	5.6	20	18.9
Interview, not otherwise specified	66	26.4	13	27.7	53	26.1	11	7.6	55	51.9
Unknown	6	2.4	2	4.3	4	2.0	3	2.1	3	2.8
Total	250	100.0	47	100.0	203	100.0	144	100.0	106	100.0

It is obvious from Table 2 that, with the adoption of a merit system, comes a decided drift toward examination as a selective device. It will be observed that four-fifths of all jurisdictions claiming merit systems also use examinations, a proportion twenty times as great as is found among jurisdictions without such systems. Furthermore, breaking down the examination group to determine the personnel classes affected, discloses that, among merit system departments using this technic 3 out of 8 apply it to all employees, while no department without a merit system uses an examination for selection of all employees.

Failure to use examination more widely as a selection device may be explained partly by the large number of small city units which would find it difficult to finance a comprehensive testing program. Certain steps have been and are now being taken to overcome this difficulty. In some states the state personnel agency renders technical and administrative services to the local agencies. In one state the cities and counties may contract with others having a merit system in operation or with the state personnel board for examinations for employees.

Furthermore, a movement now in progress would set up standard job qualifications for positions common to the federal, state, and county governments and make the list of eligibles equally accessible to each. For example, an examination acceptable to the three types of jurisdictions might be devised and given to nurses, and the list of eligibles then made available to all three units. This method, when perfected, should do much to prevent duplication of effort in personnel selection and save money now spent in such wasteful practice.

BASES FOR PROMOTION

Having selected and employed a competent staff, the executive finds policies for keeping up their morale assuming paramount importance. The single most effective means of keeping employee morale at a high level is fair compensation for service rendered, including not only a fair starting salary with the prospect of promotions in grade and increases in salary; but also annual and sick leave as a matter of right and a retirement plan.

No one has yet discovered an ideal formula on which to base promotions. It is conceded, however, that proficiency and length of service are two desirable elements in any formula of promotion; and it is doubtful that adding "at the judgment or discretion of the administrator" to this prescription is wise, notwithstanding the fact that most administrators feel the need of it to maintain control. Inspection of Table 3, however, will make it apparent that promotions either are left entirely in the administrator's hands or are limited by his judgment in more than three-fifths of the states and about two-fifths of the cities. The power to promote is usually held by the health officer; although in some cases the Board of Health or a city official is listed as having that power. Such a policy certainly affords opportunity for personal favoritism and political exploitation, even though the opportunity may not be utilized. In any case, it is to be deplored that the administrator's discretion is thus firmly entrenched as the dominating factor in promotions.

Next in importance as a basis for advancement is proficiency, listed by about three-fifths of the states and more than one-third of the cities, counting all cases in which it is the sole basis, as well as those in which it is only one factor to be considered. Since a promotion policy based on proficiency alone, or as the major basis for promotion, raises the morale of the staff and the standard of work, it is to be encouraged and commended by those

TABLE 3

Bases Used for Promotion of Employees in Health Departments, by Jurisdiction and Merit System

Basis Used for Promotion of Employees	Total		Jurisdiction											
			State						City					
			Number			Percentage			Number			Percentage		
	No.	Per cent	Total	Merit System	No Merit System	Total	Merit System	No Merit System	Total	Merit System	No Merit System	Total	Merit System	No Merit System
Automatic, length of service	8	3.2	1	1	..	2.1	5.5	...	7	4	3	3.4	3.1	3.9
Blanket increase	4	1.6	..	..	..	...	...	...	4	3	1	2.0	2.4	1.3
Administrator's disc.	57	22.8	14	3	11	29.8	16.7	37.9	43	23	20	21.2	18.3	26.0
Administrator's discretion and proficiency	46	18.4	15	6	9	31.9	33.3	31.0	31	17	14	15.3	13.5	18.2
Proficiency (alone)	36	14.4	6	4	2	12.8	22.2	6.9	30	25	5	14.8	19.8	6.5
Combinations of above bases	19	7.6	*6	3	3	12.8	16.7	10.4	†13	8	5	6.4	6.4	6.5
None provided for	21	8.4	1	1	..	2.1	5.6	...	20	9	11	9.8	7.1	14.3
Unknown	59	23.6	4	..	4	8.5	...	13.8	55	37	18	27.1	29.4	23.3
Total	250	100.0	47	18	29	100.0	100.0	100.0	203	126	77	100.0	100.0	100.0

* Proficiency included in all combinations.

† Proficiency was a factor in promotions in 9 departments (4.4 per cent); 6 departments (4.8 per cent) of those with and 3 (3.9 per cent) of those without merit regulations. Administrator's discretion was a factor in promotion in 4 departments (2.0 per cent); 2 (1.6 per cent) of those with and 2 (2.6 per cent) of those without merit regulations.

concerned with professional advancement. Not unexpectedly, such a policy is found oftener among jurisdictions with merit systems than among those without them. Conversely, state and city departments without merit systems more often leave staff promotions to the discretion of the health officer than do those with such systems. This may be due to the lack of machinery for applying proficiency ratings or other criteria.

Length of service as the only basis for promotion is used in a few departments; and it occurs as a limiting factor in a few more. Obviously length of service as a sole basis for advancement is not advocated, but for the sake of staff morale, it might well be given some consideration so long as it does not tend to work to the advantage of incompetent employees.

Various combinations of method were found in 10 per cent of the departments studied but no uniformity of pattern is apparent. For example, in some jurisdictions all employees are promoted at the health officer's discretion, except nurses who take "promotional examinations" or are "promoted as vacancies occur." Some departments pay flat salaries to their health officers, physicians, dentists, and nursing supervisors; but raise salaries of other types of personnel according to length of service. These departments say frankly that employees holding the more responsible positions have no opportunity for promotion. If no provision is made for turnover, such a policy can only result in professional stagnation. A few departments have no plan for promotion for any employee; a few others use only blanket increases.

In calling attention to the fact that a number of departments do not provide for staff promotions, budget limitations have not been overlooked. However, the claim that "It is fixed in the budget" or "We asked for it but it was

cut out of the budget" is too often a mere excuse produced by glib, if not zealous, administrators. If such an executive misses his opportunity to secure funds for his staff, the whole department and the public both suffer. It is the administrator's responsibility to urge this vital part of his program before the budget comes up for consideration by the appropriations committee. He must marshal the facts showing the necessity for promotions in time to win coöperation and before the pressure on the committee by other departments is too great. Administrators who overcome these difficulties give their employees a goal toward which to work. On the other hand, perhaps no one factor in personnel direction is more likely to reduce the morale of a staff than absence of opportunity for advancement.

ANNUAL AND SICK LEAVE WITH PAY

In order to continue to put forth his best efforts, an employee must be granted sufficient time off the job, with pay, to insure recuperation from the yearly grind. It is equally important to efficiency that he shall not be unduly penalized by illness. A liberal and definite policy regarding leave is, therefore, an administrative safeguard against employee fatigue, staleness, and dissatisfaction. Table 4 summarizes the current policies in regard to the granting of both annual and sick leave. It will be noted that, although over one-sixth of the departments either make no provision at all or make only an indefinite one, 2 weeks' annual leave is granted in a majority of the departments, and almost one-fifth of them grant 15 to 30 days. It seems significant that jurisdictions with a merit system grant more leave than do those without such a system.

Policies regarding annual leave are not uniform within departments in approximately 10 per cent of the cases. The following typical leave regulations will serve to illustrate the point:

1. Fourteen days for all except supervisor of nurses and nurses, who get 30 days
2. Twelve days for all except laboratory technician, who gets 26 days (a state department)
3. Two weeks for inspector and laboratory technician, 4 weeks for nurses
4. One month for bureau chiefs, 3 weeks for nurses, 2 weeks for others

TABLE 4

Regulations Governing Annual and Sick Leave in Health Departments, Distributed According to Existence of Merit System

	All Departments Reporting		*Merit System*		*No Merit System*	
Leave Regulations	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*
Annual, with pay						
1 week	2	0.8	1	0.7	1	1.0
10–14 days	159	63.6	87	60.4	72	67.9
15–30 days	43	17.2	32	22.2	11	10.4
No provision or unknown *	46	18.4	24	16.7	22	20.7
Sick, with pay						
1 week	8	3.2	5	3.5	3	2.8
10–14 days	61	24.4	34	23.6	27	25.5
15 days	14	5.6	9	6.3	5	4.7
3 weeks and over	25	10.0	20	13.9	5	4.7
No provision or unknown *	142	56.8	76	52.7	66	62.3
Total	250	100.0	144	100.0	106	100.0

* Includes those not specifying time, although in practice leave is granted.

In cases such as these, the department has been classified according to the policy followed for the majority of the employees, which is usually the nursing group.

Regulations about sick leave are not even so definite as those about annual leave, and provision for a fixed amount is made in only three-eighths of the cities and two-thirds of the states. Eight cities grant only 1 week of sick leave. Taking into account only the departments reporting a definite policy, it is apparent that the tendency is to grant 10 to 14 days of sick leave with pay. Here again the influence of the merit system appears to be toward a more liberal leave policy. In one city employees under the merit system may have 30 days' sick leave but those not in the system are not provided for at all.

A few departments grant sick leave for periods ranging from 1 to 3 months; others grant it according to length of service with the department. For example, one large city department grants 12 days a year which may accumulate to 150 days. Some organizations permit an employee to take sick leave with pay only until it is found necessary to employ a substitute, after which he receives no further pay until he returns to duty. This very unjust and vicious procedure penalizes the employee whose services are indispensable, while it favors the employee whose services are of relatively less value!

RETIREMENT PROGRAMS

Another factor contributing to morale and to an efficiently operating service is the existence of a retirement program. Such a program has values for both the department and the employee. First, from the department's point of view, it makes possible the separation of employees who might otherwise be retained through sympathy, even though superannuated or disabled; and second, by stimulating turnover in personnel, it attracts younger men in search of a career and keeps them during the period of their greatest usefulness. Third, it affords the employee security, an advantage both to him and to the department interested in efficiency.

Table 5 gives some idea of the problem ahead if we plan to attain such a goal. With 70 per cent of the state departments and more than 50 per cent of the city departments having no retirement system, the outlook is not promising. No help can be obtained from the Social Security Act as it now stands, inasmuch as it specifically excludes public employees from any participation in its benefits. Whether or not we should seek inclusion under this

TABLE 5

Retirement Systems in Health Departments, Distributed According to Jurisdiction and Merit System

Retirement System in Operation	All Departments Reporting		Jurisdiction									
			State						City					
			Total		Merit System		No Merit System		Total		Merit System		No Merit System	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Yes	91	36.4	13	27.7	10	55.6	3	10.4	78	38.4	67	53.2	11	14.3
No	138	55.2	33	70.2	8	44.4	25	86.2	105	51.7	46	36.5	59	76.6
Yes, but membership optional	2	0.8	..	....	..	....	..	....	2	1.0	1	0.8	1	1.3
Unknown	19	7.6	1	2.1	..	....	1	3.4	18	8.9	12	9.5	6	7.8
Total	250	100.0	47	100.0	18	100.0	29	100.0	203	100.0	126	100.0	77	100.0

Act or try to set up state or state and local retirement systems is another question for administrators to decide. It is of some encouragement to note that more than half the departments with merit systems also have retirement programs.

CONCLUSIONS

Leaders in the field of personnel administration know that high staff morale is the best assurance of effective public service. To strengthen morale they recommend establishing merit systems that will provide scientific bases for promotion, opportunity for advancement within the service, a reasonable amount of annual and sick leave with pay, and an adequate retirement program.

Data bearing on the present status of 250 health departments, with respect to these policies may be summarized as follows:

1. Sixty-two per cent of the states and 38 per cent of the departments in cities have no merit system for public health personnel.
2. Health administrators and staff physicians are most frequently exempt from the merit system.
3. The presence of a merit system tends to:
   a. promote the use of examinations as a method of selection
   b. Develop a program for personnel promotion free from political pressure
   c. Increase the proportion of departments claiming "proficiency" as a basis for promotion
   d. Increase the amount of annual and sick leave allowed
   e. Encourage the use of a retirement plan

These findings point to the fact that merit systems bring about the very things that build staff morale, and lead to more efficient work. It is, therefore, clear that if we, as public health administrators, are to attain the maximum service from our staffs, we must exert every effort toward the extension and improvement of merit systems.

Use of Ferrets in Laboratory Work and Research Investigations*

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THE ferret is a member of the weasel family, *Mustelidae*, to which belong the polecat, stoat, martin, mink, and weasel. All are characterized by a fetid odor, but this is not marked in the ferret. It is further classified as a member of the genus *Mustela*, and the sub-genus *Putorius*, var. *furo*.

It is generally assumed that the domesticated ferret is an albino breed derived from the wild polecat (*Putorius foetidus*), but it differs from the latter principally in the yellowish-white color of its fur and the pink-red color of its eyes. This is commonly known as the "English" ferret.

The North American, or black-footed ferret (*Mustela nigripes*),[1] has a pale buff, or yellow, fur with a sprinkling of dark brown hairs on the back. The under parts are buff, or cream-colored; the feet, black, or dark brown; there usually is a broad, black band across the eyes; the tail is short and colored like the body, except for a short, black tip. This species is commonly referred to as the brown or fitch ferret.

During the past 12 or 13 years, the ferret has become increasingly important as a laboratory animal, particularly for virus research. Since it was first shown by Dunkin and Laidlaw[2] to be susceptible to canine distemper, it has been used to great advantage in the study of several other virus infections.

While it is the purpose of this paper to review published and unpublished data pertaining to the use of the ferret in laboratory investigations, certain limitations prevent a complete summary at this time. The comparative newness of the species as a laboratory animal, and its limited use in this respect, explain, perhaps, why there exists a paucity of data with regard to its anatomy, physiology, endocrinology, and nutritive requirements. It is hoped that this report will stimulate further investigations along these lines.

ANATOMY

For laboratory purposes, there is little demand for ferrets of definite weights; although in general an adult animal is usually desired. In using the term "adult," the breeder invariably refers to an animal 4 months of age or older. However, at this age, the ferret has not attained its full weight and growth.

Several strains have been developed for specific purposes. By selective breeding, large ferrets have been produced for rabbit and woodchuck hunting; smaller strains have served admirably for rat extermination work. There is a tendency now on the part of breeders to concentrate on the produc-

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tion of smaller animals for laboratory purposes, since this use of the ferret in recent years has completely revolutionized the industry.

The brown or fitch ferret, more regularly used in our work, will average 1,363 grams in the male at approximately 15 months, and 997 grams in the female at the same age.

The lungs are a delicate pink color in the normal state, and occasionally may show small, flat, but slightly raised, yellowish-white areas on the surface. Dunkin and Laidlaw [2] were of the opinion that these markings were lesions seen in about one-third of their cases of ferret distemper. However, we, like Shope,[3] have observed them at times in normal ferrets.

Little can be said at this time regarding the arterial and venous systems other than to note that the carotid artery and jugular vein are prominent and readily accessible.

In three brown males, bled from the ear, Slanetz [4] reports an average red cell blood count of 9,810,000 per cu. mm. His white cell counts varied from 7,120 to 21,600 per cu. mm. in four trials, the highest being found in a female.

In our similar number of counts on bloods from normal ferrets, 15 months of age, taken by cardiac puncture, the following averages were obtained:

Red blood cells	8,500,000 per cu. mm.
White blood cells	8,900 per cu. mm.
Hemoglobin	84 per cent
Polymorphonuclears	65 per cent
Lymphocytes	33 per cent
Monocytes	1 per cent
Basophiles	none
Eosinophiles	1 per cent
Young forms	9 per cent

In comparison with the 7.5–8 microns diameter of the human red blood cell, that of the ferret appears to be about 5 microns.

PHYSIOLOGY

Little is known regarding some of the physiologic processes of the ferret. Data on urine, its specific gravity, reactions, and normal constituents are nil. Not much more is recorded on blood chemistry. It is hoped that such information can be made available to laboratory workers later.

Temperature—The normal range of the rectal temperature is from 101.0° F. to 102.5° F. However, even the mildest type of restraint exercised while taking the temperature will cause its rise to as high as 104.0° F. It is always advisable, before starting critical experiments involving accurate temperature readings, to accustom the animal to the introduction of the thermometer into the rectum, by taking the temperature twice daily for several days. The thermometer should be small and well lubricated if peri-anal inflammation is to be avoided.

Respiration—This ranges between 33 and 36 per minute in the normal ferret.

Pulse—No information is available on the pulse rate. However, it is so rapid that data will have to be obtained through kymographic readings.

Blood Chemistry — Our superficial studies would indicate that normal ferret blood contains 131 mg. of sugar per 100 cc., 7.2 mg. of calcium per 100 cc. and 41.3 mg. of N.P.N. per 100 cc. This work is being continued.

Temperature Requirements — Under ordinary conditions, the ferret is a hardy animal and is able to withstand exceedingly low temperatures. It suffers somewhat, however, during extremely hot weather. At these times, if the animals are quartered inside, means should be provided for circulating the air in the animal house. No difficulty is experienced in keeping them outside even during severe winter months, provided they are housed in adequate pens.

Period of Oestrum—Information obtained from several breeders indicates that the female ferret, under conditions of climate prevalent in the East and Middle West, will come into season for the first time early in March of the year

following birth. Carnochan [5] is of the opinion that oestrum occurs fully a month earlier in some parts of the West, particularly in California.

Provided the female ferret, or jill, as it is called, is bred and gives birth to a litter, a second oestral period will usually occur in July, although there are cases in which this second period occurred as late as the middle of August. According to Hammond and Marshall,[6] oestrum persists in the ferret in the absence of coitus for as long as 5 months in some cases. Under such conditions, the animal gradually becomes emaciated and debilitation may lead to death. At least, the possibility of a second litter from such an animal during the same year becomes nil.

These investigators also point out that ovulation may take place at any time during oestrum, but only after coitus. If fertilization does not occur, false pregnancy arises and all evidences of oestrum disappear.

No difficulty is experienced in detecting the presence of oestrum. The vulva enlarges to a considerable degree and persists at such an increased size throughout the period, but is reduced to its anoestrum size as soon as pregnancy takes place.

Mating — Hammond and Walton [7] state that the average duration of coitus is about 2 hours, but it may vary between 15 minutes and 3 hours. American breeders, however, customarily place the male with the female for 24 hours early in the oestral period. These workers also determined that ovulation takes place in the female about 30 hours after coitus.

Period of Gestation—This is normally 42 days.

Size of Litters—The average size of the litter raised in this country is from 6 to 8, although occasionally there may be as many as 10 or 12. Two litters are born annually, one in May and one in September.

Development of Young at Birth—When born, the members of a litter are hairless and blind. Each will weigh approximately 10 grams.

CARE OF YOUNG—FEED REQUIREMENTS

Approximately 10 days before the litter is due, the nest box (described later) is loosely filled with wheat straw, or similar material, and pressed down in the center to form a nest. Such a box is provided for each pregnant female and her litter. As the time for parturition approaches, the mother will further prepare the nest by lining it with body hair. After the young ones are born, she prepares additional protection by pulling down over them the excess straw in the nest box.

Observations of the young should be made occasionally after the first few days following birth. It is best to do this when the mother has left the nest box to feed. If the litter is large, it is sometimes advisable to remove all over 6 of the litter and place them with a foster mother during the suckling period. In order to avoid a common condition in the nest box referred to as "sweats" by the breeders, the straw must be kept dry and periodically removed from overtop of the young ferrets. The mother insists on keeping her litter covered in this manner. Young ferrets so affected "sweat" to such an extent that their bodies become quite moist. Scours usually accompanies the condition.

The young open their eyes at about 4 weeks of age, when they can be fed for the first time. While still in the nest, they may be given a little bread soaked in milk. Occasionally, finely chopped meat can be added to this diet.

While suckling, the mother should be supplied plentifully with whole milk and bread. Small amounts of meat are also given daily.

For a short time after weaning, the young ferrets are fed thrice daily; later,

twice daily. Milk, bread, and meat are given in quantities just enough to satisfy each individual. Overfeeding is to be avoided.

Diets recommended for grown ferrets are varied, but all seem to serve their purpose. Raw meat only, once daily, seems to be quite satisfactory, but milk, diluted 50 per cent with water, should be added to such a diet. The majority of the breeders insist that all salt should be eliminated from the diet, but 0.5 to 1 per cent has been used in some of the rations without harm to the ferrets.

We have been quite successful in feeding a mush made from whole wheat flour and water. This is made in bulk for storage, without adding salt, and mixed with milk for each day's feeding.

Just enough is given once daily as will be cleaned up completely by the animal. In addition, about 4 ounces of horse meat per animal is given two or three times a week.

HANDLING

Cages—For all practical purposes under laboratory conditions, cages similar to those used for rabbits are quite satisfactory. These are made preferably of metal and are 18 inches wide, 22 inches long, and 14 inches high. The bottom is solid. All sides and the top, of a hinged or slip-on type, are made of heavy, ½ inch mesh wire. Wood-shavings, preferably cedar, are used as litter. Feed cups are suspended from the sides of the cage.

The ferret is an unusually clean animal and habitually deposits its excretions in one corner of the cage. Although it is often not necessary, the litter is removed and replaced every 2 days. The cage itself is thoroughly cleansed and steam-sterilized every week. This type of cage is used to house a single ferret on experiment, but can be used for two normal ferrets being held in reserve for subsequent use.

These cages, when they contain ferrets on experiment, should be kept widely separated. If placed side by side, infection can be spread readily from cage to cage through the open mesh work of the sides by the droplet mode of transmission. Much discouragement and wasted effort can be avoided by using an isolated room containing completely walled-in cubicles, one for each cage, when ferrets are being used in the study of a highly communicable infection.

For long-term experiments, we much prefer a more elaborate cage with an exercising run and a housing compartment containing a nest box. These are kept outdoors in a shaded area during the hot summer months. Even in extremely cold weather, the ferrets do much better in such pens than when quartered indoors. This type of cage is also ideal for breeding ferrets.

The exercise run is 24 inches wide, 24 inches high and 36 inches long. The bottom, sides, and top are of heavy, ½ inch mesh wire. One end, which may be called the rear of the complete unit, is made of tongue-grooved boards with hinges on the bottom so that it can be opened to permit feeding as well as cleaning the wire run. The housing compartment at the front of the unit is an integral part of the exercise run, and is separated from it by a board partition, at the bottom and to the side of which is a hole 4 inches in diameter to permit the ferret to pass from the compartment to the run. Over this hole in the partition is a sliding door made of thin metal. This can be opened or closed from the outside of the unit by a push rod.

The floor of the housing compartment is 24 inches square. The front is 18 inches high, 6 inches lower than the back (partition separating it from the exercising run). The roof lifts up on hinges and slopes from the rear downward to the front. The bottom, walls, and hinged roof are made of wood.

Roofing paper protects this part of the unit from rain and snow.

Inside the housing compartment is placed the nest box, made of wood, with a hinged top, into which are bored about 12 holes for ventilation purposes. The box is 13 inches long, 13 inches wide and 12 inches high. At one end, a hole, 4 inches in diameter, permits the ferret to leave or enter the box. Woodshavings are used as bedding both on the floor of the compartment and in the nest box. During warm weather, the ferret uses the compartment. In cold winter weather, it seeks more adequate protection in the nest box.

Restraint—As a rule, it is not difficult to restrain ferrets, despite their viciousness and tendency to bite upon the least provocation. Some workers and breeders insist on using heavy rubber mittens to protect their hands and fingers. These are cumbersome and really unnecessary. It is only the occasional ferret that cannot be handled with ordinary care.

The first step in restraining the animal is to grasp it quickly by the tail with the right hand when its back is turned. This should not be attempted until the ferret's attention is attracted to something in front of it. The animal is remarkably quick and agile and can turn upon itself and "sink" its canine teeth into the offending fingers. Should this occur, the hold on the animal must be released. The ferret will then reciprocate. As long as an attempt is made to continue the restraint, the animal will hold on with its sharp teeth and cause an ugly, lacerated wound. These have never become infected in our experience and always heal by first intention.

As soon as the tail is grasped with the right hand, the ferret is lifted from the cage. While still holding the tail, it is placed on top of the cage with its fore legs over the side. In this position, it is able to obtain a degree of anchorage with the fore legs and pull against the restraining hand. While its attention is diverted in this direction, it is grasped quickly, with one swift motion, encircling the neck immediately back of the ears, by the first and second fingers of the left hand. Then, with the thumb and all fingers of the left hand, while the original position is maintained, the fore legs can be grasped and restrained. The hold on the tail is released by the right hand, which is then used to grasp firmly the hind quarters and legs. When restrained in this manner, almost anything can be done with the animal. The rectal temperature can be taken, inoculation by various routes can be accomplished, and even a cardiac puncture is possible; although, in the latter case, it is well to place the animal under light ether anesthesia.

Ether can be administered by a small cone while the animal is restrained as described. It is more practicable, however, to place the ferret under a bell jar on a desiccator plate (with legs), under which there is cotton saturated with ether.

When it is necessary to pass a stomach tube, the ferret is restrained as previously described and held up by the left hand encircling the neck and fore legs with the muzzle facing an assistant. A piece of ½ inch dowling, with a hole ¼ inch in diameter bored through it, is manipulated into place by the assistant between the upper and lower teeth. A small catheter is then inserted through the hole in the dowling and slowly and carefully passed down into the stomach. This procedure is used to administer the full dosage of a drug directly into the stomach. The drug to be given is forced into the catheter from a syringe.

COMMON NATURAL DISEASES OF THE FERRET

Without question, the most serious natural infection of the ferret is that

caused by the virus of distemper. The disease has an unusually high mortality. On two occasions, we have lost all individuals in our reserve stock through contact infection. We now avoid holding a large reserve stock and have contract agreements with a breeder to forward fortnightly shipments throughout the year. All incoming ferrets are quarantined for 10 days, during which period any incubating infection that might be brought in with them will develop.

For a complete and detailed description of distemper in the ferret, we refer to the report of Dunkin and Laidlaw.[2] Treatment is unsatisfactory.

Constant attention must be given to the prevention of "foot-rot," which is caused by a mange mite. Damp and filthy litter in the cages and nest boxes favor its development. The appearance of swollen feet, covered with scabs, calls for immediate treatment, which is quite satisfactory if started early. Some breeders use a kerosene dip. Carnochan[5] claims unfailing success by applying xylol to the affected parts after removal of the scabs with forceps. Two treatments are given at an interval of 3 days, after which Danish ointment is applied every few days. He also advises lightly dusting of the bedding with flowers of sulphur. This also acts as a flea repellent.

Scabies sometimes appears on the tail and over the back. This can be treated similarly, or with sulphur ointment. Ear canker, while not common, occurs. Ear drops containing liquid petrolatum, phenol and tannic acid are used in these cases.

Closely akin, if not identical with distemper, is another virus infection of ferrets studied by Slanetz and Smetana[8] in October, 1934, after it occurred epizoötically in their colony of ferrets. The disease was essentially respiratory and was complicated by a secondarily invading hemolytic streptococcus. Cytoplasmic and intranuclear cell inclusions in the epithelial cells of certain organs were indistinguishable from those occurring in canine distemper. While these authors were unable to demonstrate any immunological relationship between the virus of this ferret disease and the viruses of canine distemper and human influenza, we (unpublished data) succeeded in immunizing a relatively large group of ferrets against definitely known canine distemper virus with a formalinized vaccine supplied us by them, and which was composed of infected lung tissue obtained from ferrets dead of the virus infection in question. It would appear, therefore, that this virus was at least a variant of the common distemper strain.

Subsequently, in 1935, Spooner[9] apparently studied the same disease as it occurred among breeders' stocks of ferrets. It was his opinion that he was dealing with a form of distemper antigenically related to dog distemper, since his results differed only in minor points from the description of canine distemper in the ferret given by Dunkin and Laidlaw.[2]

Ferrets are also subject to "boils," which occur in the neck region and often involve the salivary glands. A variety of organisms have been isolated from these, the most common of which has been *Staphylococcus aureus*. In some quarters, it is presumed to be introduced through the feed.

A nonspecific pneumonia sometimes takes its toll in ferretries, but there is evidence that in some cases, at least, it is due to hemolytic streptococcic infection precipitated by one or more debilitating factors. Brightman[10] recovered this organism from the lung and heart blood of ferrets reacting to intranasal instillation of bacteriologically free tissue suspensions containing influenza virus. He concluded that the streptococcus was of ferret origin and

that it belonged to Group C of the Lancefield classification.

It has been the experience of Francis and MaGill [11] that some ferrets, during the winter months in particular, are carriers of hemolytic streptococci, or small Gram-negative bacilli, in the respiratory tract. A purulent rhinitis occurs sometimes. Similar observations have been made in our laboratories.

Several species of internal parasites may find the ferret a suitable host. As parasitic infections in this animal are rather uncommon, and even rare, space and time will not be given to their description. For detailed information, Mönnig's [12] text on helminthology may be referred to.

ARTIFICIAL INFECTIONS

Since the report of Laidlaw and Dunkin [13] of the results of studies on the immunization of ferrets against canine distemper, these animals have been used widely in further investigations on this disease. References are too numerous to mention here; however, brief statements will be given regarding two recent reports.

DeMonbreun [14] meticulously studied the histopathology and cytology produced by the virus and found them similar in dogs and ferrets. Dochez and Slanetz [15] used the animal to a limited extent in investigating the effect of sodium sulfanilyl sulfanilate in the treatment of canine distemper.

Distemper in the ferret can be induced very readily by exposure to contact infection and by intradermal, subcutaneous, intramuscular, intraperitoneal, intracerebral, and intranasal inoculation.

References to the use of the ferret in studies on human influenza virus are also legion. Smith, Andrewes, and Laidlaw [16] were the first to attempt the artificial infection of various laboratory animals with filtrates of throat washings. The results were negative until the ferret was used. A full description of the symptoms and pathology is given in the report of these investigators.

After the intranasal instillation of egg-influenza virus, Burnet [17] found that ferrets usually showed no symptoms or temperature rise, but such inoculation induced a high grade immunity. Francis and MaGill [11] found that influenza-immune ferrets may be encountered among stock animals not infected experimentally. They were unable to state whether or not this developed as a result of contact of human origin.

Several investigators have also used the ferret in studies on swine influenza. Smith, Andrewes, and Laidlaw [16] observed that these animals, when inoculated with virus obtained from Shope, gave rise to a disease indistinguishable from the infection caused by the human virus. Later, Shope [18] confirmed this observation and showed that after 16 serial transfers of the swine influenza virus in ferrets there was no alteration of its pathogenicity for swine. With virus emulsions from ferrets suffering from influenzal attacks caused by either human or swine virus, Laidlaw, Smith, and Andrewes [19] were able to produce a hyperimmune serum of significant potency in horses.

The literature on the use of the ferret in researches conducted on the common cold is practically nil. However, in a limited trial, Smith, Andrewes, and Laidlaw [16] failed to infect them with nasal secretions from a subject suffering from a severe common cold. There is reason to believe that more conclusive data of this nature are available, but not published.

There are a number of other infections, less extensively studied, in which the ferret has been used. Francis and MaGill [20] recovered the virus of Rift Valley fever from the respiratory tract of three human patients and transmitted it to ferrets by intranasal instillation.

The experimental disease in these animals was characterized by fever, pulmonary lesions, and hemorrhagic phenomena.

These same workers, Francis and MaGill,[21] were able to infect ferrets consistently with an unidentified virus obtained from human patients suffering from an epidemic disease similar to influenza. By the intranasal route, it produced extensive, fatal pneumonic lesions. By the subcutaneous route, it produced local granulomatous induration of the skin with enlargement of the regional lymph nodes. The investigators tentatively named the virus that of acute meningo-pneumonitis. Later, Stokes, Reimann, and Shaw [22] reported the isolation of a comparable agent from a human patient, the secretions of which produced a comatose state in 24 hours after intranasal instillation in a ferret.

Recently, Dalldorf [23] has observed that the ferret is susceptible to a symptomless form of infection caused by the virus of lymphocytic choriomeningitis. Virus may be demonstrated in the brain, spleen, liver, and blood, and intranuclear inclusion bodies are found in the cortex of the adrenals.

While working with Swiss mice on human influenza studies, Dochez, Mills, and Mulliken [24] encountered a virus prevalent in three different sources of supply. The infection was characterized by pulmonary lesions with high mortality after several passages through additional mice. This mouse virus in the form of lung suspension, when inoculated intranasally into ferrets, produced a sharp, early rise in temperature to about 105° F. This was occasionally followed by a second rise. Respiratory symptoms were sometimes seen, but the transmitted infection did not prove fatal. Subcutaneous and intraperitoneal inoculation did not result in infection.

In general, the ferret is susceptible to a number of viruses when the inoculum is introduced intranasally. Other routes of inoculation, as a rule, fail to produce clinical manifestations. However, in the case of the virus of fowl pest (not present in this country), Findlay and MacKenzie [25] were able to infect the ferret by intraperitoneal and intracerebral inoculation, as well as by intranasal instillation. The virus was distributed in the brain, liver, and spleen, regardless of the route of administration.

METHODS OF INOCULATION

The ferret is amenable to all common routes of inoculation, but as indicated previously, intranasal instillation is most frequently used. This is best performed while the animal is under light ether anesthesia. If it is attempted under ordinary restraint, the animal's sneeze reflex causes considerable difficulty, making it impossible to administer a graded dose.

After the animal has been anesthetized (lightly), Shope [18] uses a 2 cc. syringe, without needle, and applies the blunt tip of the syringe to the external nares. A small amount of the inoculum is expressed from the syringe each time the animal inspires. In this manner, the required dose may be given without the loss which occurs when the ferret sneezes. A graduated pipette serves the same purpose and permits the instillation of a drop of the inoculum at a time. Ferrets so inoculated usually react with a more severe type of the transmitted infection than when not anesthetized. This is true, particularly, when the virus used is of human or swine influenza origin.

No description of the technic involved in the use of the intradermal, subcutaneous, intramuscular and intraperitoneal routes of inoculation is necessary. To our knowledge, the intrathecal route of administration, and inoculation into special organs and with infected insects have not been practised on the ferret.

In preparation for an intracerebral inoculation, the hair over the cranial site is clipped close to the skin, which is then cleansed with alcohol and painted with iodine. The skin covering the top of the skull is then stretched to one side and held in this position. A short incision is made through the skin with the point of a scalpel. Through this incision, the skull cap is punctured with a small awl-like instrument, which can be made by driving a small brad into a piece of dowling. The head of the brad is filed down to a sharp point. During the operation, the point should not be permitted to pierce the brain substance. This can be controlled by regulating its length. After the inoculation is made by inserting the needle of a syringe holding the inoculum through the hole in the skull cap, the skin over the skull is permitted to assume its natural position, covering the puncture in the skull.

Intravenous inoculation into the ferret, is best performed by cutting down through the skin over the jugular vein before attempting to strike it with a hypodermic needle. The wound may be closed with one suture after the injection and protected with a collodion and shredded-cotton dressing.

These two latter methods of inoculation are greatly facilitated when the animal is placed under light ether anesthesia.

Trillat and Beauvillain [26] have transmitted influenza virus to the ferret, with resulting typical symptoms, by exposing the animal in an enclosed box to air charged with a fine suspension of the infectious material. They also were successful in reproducing the disease in ferrets by instilling the virus into the conjunctival sac.

COLLECTION OF SPECIMENS

Blood can be obtained in quantity with comparative ease from the ferret by cardiac puncture. The animal is held flat on its back and the needle inserted between the ribs, straight downward, just left of the xiphoid cartilage. Small quantities of blood can also be obtained by pricking rather deeply the skin of the tip of the ear. Burnet [17] mentions obtaining blood from the ferret by cutting off the extreme tip of the tail under light anesthesia.

The collection of urine and feces offers a somewhat difficult problem. However, the mere handling of the ferret quite regularly is followed by urination. Small amounts can be caught in a small container at such times. Insertion of a well lubricated, clinical thermometer into the rectum will quite often induce defecation, at which time a small specimen can be gathered.

When the ferret is used in influenza studies, the turbinate tissue is often harvested as a source of virus. The animal is destroyed by intramuscular or intracardial injection of approximately ½ grain of strychnine sulfate, then fastened to a length of board slightly longer and wider than the animal itself with the abdomen down and the legs stretched outward. A piece of cord is passed around the neck at the base of the skull, through holes bored in the board and tied underneath. The lower jaw is anchored to the board in the same manner. In this position, the head of the animal is held firmly during the succeeding operations.

The skin over the skull and down over the nose is removed completely. A small hack-saw blade is then used to cut through the bone transversely across the head from ear to ear. Another incision through the bone is made at right angles extending from the transverse cut down over and bisecting the nose. With a small, but heavy-bladed knife, the two lateral flaps of bone can be pried off the underlying sinuses. The turbinates are then removed with a sterile, small scalpel and forceps.

SUMMARY

1. *Anatomy*—The ferret presents no marked differential features, although the liver and spleen are heavier in proportion to the body weight than is the case in other small animals. The weights of males and females and blood counts are recorded.

2. *Physiology*—Data are presented on the rectal temperature, rate of respiration, a limited amount of blood chemistry and the period of gestation. More detailed descriptions are confined to oestrum in the ferret, mating, size of litters, and the development of the young at birth.

3. *Care of Young—Feeding*—The young should not be disturbed during the first few days of life. Further care and the feeding of the litter are discussed, as well as various diets used for grown animals.

4. *Handling*—Common types of cages and pens used in quartering normal and experimental ferrets and the restraint of the animal are described at length.

5. *Common Natural Diseases*—The ferret is heir to infection caused by the virus of canine distemper and a variant of this agent. Foot-rot is a common condition appearing in this animal. Hemolytic streptococci, a purulent rhinitis, "boils," scabies, pneumonia, "ear canker," and internal parasites cause less concern.

6. *Artificial Infections*—The ferret has been used principally as an experimental animal in the studies of such virus infections as canine distemper and human and swine influenza. Other viruses producing a syndrome in the animal are those of Rift Valley fever, an acute meningo-pneumonitis, fowl pest, and one found in Swiss mice.

7. *Methods of Inoculation*—The ferret is amenable to all of the more common routes of inoculation. The technic of administering an inoculum intranasally and intracerebrally under light anesthesia is described.

8. *Collection of Specimens*—Blood may be obtained with ease by means of cardiac puncture. Ear and tail bleedings are also used. The collection of urine and feces presents a somewhat more difficult problem. A method of harvesting turbinate tissues is described.

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Appraising a School Health Education Program*

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THERE is little question that programs of school health education need to be and can be improved. One finds a growing appreciation among health educators that improvements can best be realized through an evaluation of existing programs in terms of the objectives on which the programs are based.

School health education today is directed toward bringing about desirable changes in the health behavior of children, as well as better attitudes and more thorough understandings in regard to health. Therefore, evaluations of school health education programs ideally should be centered around a study of changes in child health behavior, in attitudes, or in understandings which occur as a result of the program.

Such studies are difficult to make in view of the fact that child changes are often slow and complex and cannot serve as wholly adequate measurements of a program which is being appraised over a short period of time. In addition to the study of the pupils themselves, it may therefore be necessary to consider, in an evaluation of school health education, factors of the school program which are assumed to help produce desirable child adjustments. These factors may include such aspects as teachers' work; the physical environment of the school; the provision of opportunities for experience and practice in terms of whatever changes are being sought and the content of courses.

Evaluation of school health education programs may range from the informal and continuous checking by individual students and teachers of program outcomes to the more formalized and less frequent studies of outcomes made on a broad scale. In a functioning program, both types of evaluation have their place. This discussion, however, will focus on the more comprehensive type of procedure, which, if participated in fully by teachers as well as by supervisory and administrative staff, may have values in the classroom equal to less formal methods.

EVALUATION METHODS

Evaluation studies in experimental school health education programs have been commonly approached in one or

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more of several different ways. Three are mentioned here.

1. *Studies of the effects of the program at a particular stage of development as judged against predetermined standards.*

Morgan [1] in 1936 evaluated health education in the secondary schools of Tennessee in terms of a state-wide study of dietary hygiene as it existed among secondary students in that year. The New York State Regents' Inquiry [2] into the school health programs of that state in 1936 and 1937 consisted of studies of health conditions which were found in selected schools during the short period of the Inquiry. In both instances, standards were set up against which to check the findings.

2. *Contrasts between two periods in the development of the program*

Three typical negro rural schools in Tennessee were studied by the Julius Rosenwald Fund [3] at the beginning of a special health education project in 1932 and again in 1936 after a period of intensive program development. These studies were made in terms of program objectives.

3. *Contrasts between experimental and control groups*

a. *Cross-sectional*—Shuttleworth,[4] in a series of early studies in Cattaraugus County, N. Y., contrasted health conditions in selected schools in Cattaraugus County which had been exposed to a generalized county health program, with conditions in a control group of schools in Steuben County. In Turner's Malden studies,[5] experimental groups exposed to a health education program and a control group were compared as to growth progress and health habits after several years of conscious program building in the experimental groups.

b. *Longitudinal*—The Elizabeth McCormick Memorial Fund Studies, reported by Hardy and Hoefer,[6] consisted of an appraisal of an experimental classroom health instruction program, which was begun in Grade 3, in 1923. Periodic records of physical growth, health behavior, and the like were kept for individual pupils over a 4 year period in both an experimental and a control group. Progress in the two groups was contrasted.

A variety of instruments may be employed in evaluation studies, the selection of which should be determined by their effectiveness in measuring the program objectives under consideration. Often more than one evaluation procedure may be necessary in order to give an adequate appraisal of a particular outcome.

In school health education, surveys, questionnaires, and written tests have been widely used for the measurement of results. Growth records, physical examination findings, records of defects corrected, and pupils immunized have served as indices. A critical discussion of each of these methods or approaches is beyond the possibilities of this paper, since each must be judged in relation to its specific use. It is clear, however, that in the evaluations of the future, greater consideration must be given to the development of more varied and effective instruments. Old procedures must be refined through further experimentation, and new technics, such as direct observations, anecdotal records, and interviews must be explored.

Tyler [7] has stated, "Evaluations are not likely to represent indubitable proof of the success or failure of current educational endeavors. They should present evidence, reasonably objective and accurate, which throws additional light upon the value of these experimental programs."

The soundest evaluations are those which are set up concurrently with the undertakings that are to be measured. They are planned coöperatively by all who are to have a part in the function-

ing of the program, including teachers, administrators, and specialists in school health problems. Only thus may they be relevant to the problems under study and provide adequate data which are free from unnecessary distortion.

Methods used in a special evaluation study will be discussed in some detail in the following paragraphs.

A SPECIAL EXPERIMENT WITH EVALUATION METHODS

As a part of an experimental school health education project which extended over a 6 year period (1932–1938) in Cattaraugus County, N. Y., a series of evaluation studies was attempted in an effort to determine the effectiveness of the program in terms of two objectives, namely, the improvement of pupil health behavior and of pupil understanding in relation to health. Evidences of progress, at both the elementary and secondary levels, were sought through studies of pupil health practices, pupil health information, and phases of the program which were believed to have potential influence in bringing about the desired changes in the children.

At the elementary level, to which this discussion will be limited, comparisons were made between conditions as they existed in the one- and two-teacher schools in 1932, near the beginning of the experimental project, and again in 1936 or later. Comparisons also were made between conditions in Cattaraugus County and a control group of schools in Steuben and Allegany Counties in 1936 near the end of the experimental work. The control group of schools was comparable in all respects except that it lacked organized school and community health programs such as existed in Cattaraugus County. Groups in the studies varied from all of the schools to but a few. Evaluation methods included pupil questionnaires on daily health practices; health information tests; classroom observations on pupil health practices; teachers' work and environmental conditions; teacher questionnaires on work in health education; school environmental surveys; and parent interviews.

The methods employed in the study of pupil health practices and teachers' work will be analyzed here at some length in order to illustrate the variety of methods which may be used and to present certain difficulties that exist in common evaluation procedures. It is only by such critical approaches to existing or projected methods that future progress in this difficult field can be anticipated.

1. *A Study of Pupil Health Practices*

One objective of the school health education program in Cattaraugus County is stated thus: "To help each child to develop and practice health behavior which will contribute to his own well-being and that of others, and progressively to assume greater responsibility and self-direction in this."

Evidences for improvements in behavior were sought through studies of both home and school health practices.

A questionnaire on daily health practices formed the basis for the home studies. Previous experience with this questionnaire, developed by the American Child Health Association for a part of its "Health Survey of 86 Cities," had shown the trustworthiness of the pupils' answers. The questionnaire dealt with sleeping, eating, play, and cleanliness habits largely associated with home living, food in the day's diet, and dental care. The questions follow:

"WHAT YOU USUALLY DO"

Directions:

1. Pass out sheets of paper on which pupils will write answers as questions are given. Have each pupil write date, grade group, and school at top of paper.
2. Let older brothers or sisters help younger ones answer their questions.
3. Answers should be obtained from all

children in Groups C, B, A (Grades 4–8). If possible, obtain complete answers from those in lower grades.

Questions:

1. What time did you go to bed last night?
2. What time did you get up this morning?
3. Name each thing you ate for breakfast this morning.
4. What did you eat for lunch this noon? (not given in 1932)
5. What did you eat for supper or dinner last night?
6. How many cups of coffee did you drink yesterday?
7. How many glasses of milk did you drink yesterday?
8. Did you have an all-over bath last week?
9. Did you brush your teeth yesterday?
10. Have you been to a dentist in the last year (since January last—1932)?
11. How many days were you out of school last week because you were sick?
12. Do you sleep in a room all by yourself?
13. Do you usually eat what is put before you at the table?
14. What does your mother usually give you to eat when you come home in the afternoon after school?
15. What do you usually do after school in the afternoon until your evening meal? Write down one or more of the following: play outdoors, do outdoor chores, help mother in house, play indoors.
16. Do you sleep with a window open?

During the fall of 1932, the set of questions was given by the teachers in the rural schools of Cattaraugus County, N. Y., to all pupils grades 1–8. The same questions were given again in the same schools in the fall of 1936. This time they also were given to the pupils in the control group of schools previously mentioned. Written instructions were prepared for the teachers in order that the tests might be administered as uniformly as possible. The answers were tabulated by one person.

The extent to which these questions were suitable instruments for measuring program objectives needed consideration. Since the program sought to help children to improve their daily health practices, a study of such practices as were included in these questions seemed appropriate. The practices, however, were largely associated with home living, and home influence is known to be great in respect to home habits. Therefore, any changes, or lack of changes, which were found could not be associated entirely with the school program. Moreover, in Cattaraugus County, home influence might also be colored somewhat by the amount and quality of the general community health program, which had developed to a high level in the county. It, therefore, had to be assumed that any superiority which might be shown in Cattaraugus County over the control group should not be attributed to the school health program without taking into account the influence of the home itself, the county health program, or other factors.

A thorough analysis of the data showed findings that had a direct bearing on the program objective involved. It was discovered that health practices in 1936 were significantly better than in 1932, and also than in the control group in 1936. The evidences of improvement, which by and large were most striking at the upper grade levels in 1936, seemed to indicate that the Cattaraugus County school program was slowly producing beneficial effects in aiding pupils to assume greater responsibility for the practice of health habits. If the home had been the principal educative force, one might expect to see more nearly the same differences at all grade levels, and in all three groups studied. Since the principal variable apparently was the school health education program, it seemed fair to assume that it played a vital rôle in bringing about the better practices of Cattaraugus County children in 1936.

Pupil health behavior at school was studied by means of classroom observations. An observation schedule was prepared for the purpose of revealing health practices of children in rural school situations. The situations for study were determined through: (1)

careful consideration of specific objectives of the local program, especially as stated in the handbook which was being used by the local teachers, (2) a study of a teaching guide recently issued by the New York State Education Department, (3) a review of numerous outlines suggesting methods of studying children, (4) expert advice from a specialist in child guidance, (5) deliberation by the director of the experimental project, and others, on problems observed during many previous visits to classrooms. The original observation form, prepared by the observer, the director of the county project, and the specialist in child guidance was revised after preliminary experimentation with it in a group of schools. Some items were omitted entirely, while others were changed for more accurate observation and recording.

The schools for study were selected at random from lists of teachers who were in their schools for the second year or longer. The teachers had been rated by their district superintendents for their general teaching ability, and a proportionate number were selected from each of the three classifications used. The observations in all schools were made by one person and at the same time of day. Each group was observed once. The hours from 9 to 1 were chosen because they gave a good sampling of the school day and also gave opportunity to study noon hour habits of the children. The observer alternated her weeks of observation between the experimental group and the control group of schools in order that the possible influence of seasonal changes might be the same for each group. Observations were directed toward the teacher and her program, the mental attitudes of the children and the school environment, as well as toward the children and their health practices. This discussion is limited to the observations on pupil health practices.

The schedule contained very specific situations for observation which would be indicative of spontaneous everyday behavior within the classroom. A few typical indices are listed below:

Outside clothing is worn in school.
Hands are washed before eating.
Mid-morning lunch consists of milk or fruit.
Fingers, pencils, crayons, etc., kept out of mouths.

The schedule was set up so that records were made of only those acts of individual children who were in situations which gave opportunity for the kind of behavior being studied. Some observations were made on the basis of time sampling. For example, all pupils were observed over a period of 3 minutes for evidences of keeping fingers, pencils, crayons, etc., out of the mouth.

Despite the care which was given to the preparation of the schedule, a number of items were found to be stated in such a way as to make objective observation difficult. In the summary of findings, it was, therefore, necessary to eliminate all items which gave opportunity for error in interpretation. The next step in the further refinement of this schedule will be experimenting with its use by several observers until the findings are comparable. If the schedule should be tried in a new situation, it also will need to be checked for its validity in that situation.

Further experimentation is needed to develop more adequate methods for the study of the effects of a health education program in terms of pupil health behavior. To date little has been done with teacher observations regarding improvements in daily living practices of individual children. Studies of changes in more subtle forms of behavior, such as those which occur in situations that require selection of several alternative behaviors, are lacking. Few comparative studies of the effects of different methods, contents, and materials have

been made. Simple record forms, adapted to classroom use, are essential before real progress in these directions can be expected.

2. A Study of Teachers' Work in Health Education

The whole structure of education is built on the assumption that teachers have an influence in forming habits, in changing attitudes, and in adding to the knowledge and understanding of children. In view of this fact, it was decided, as a part of the evaluation studies in Cattaraugus County, to attempt to appraise the program in terms of its effect on teachers' work in health education. Methods used were: (1) classroom observations; (2) teacher questionnaires on health teaching activities and results during the current school year; and (3) interviews with parents. The first and second methods were applied in both Cattaraugus County and the control group, while the third was applied in Cattaraugus County only. The procedures followed in classroom observations were similar to those just described in relation to pupil health practices. The teacher questionnaires and parent interviews were experiments with new methods.

Near the end of the school year in 1936, 6 questions on health teaching activities were mailed by the district superintendents to all teachers in Cattaraugus County and to about 100 teachers in the control group. Those questions were as follows:

What health teaching activities have you carried out successfully this year?

Please describe in this space at least one in some detail.

What changes have taken place in the health behavior of your pupils as a result of your health program?

What changes have taken place in the school environment as a result of your health program?

In what ways have you tried to reach the parents in health matters? A brief description and a critical statement of your success in this would be helpful.

What improvements do you plan for next year as a result of your experiences this year?

In general, the questions seem to have been understood by the teachers. There were no irrelevant answers on the questionnaire returns, but many were incomplete.

The returns were rated independently by three individuals who were professionally engaged in some form of health education work outside the counties under study. The ratings were made in terms of 7 items of importance in evaluating health instruction. These were the inclusion of important areas of health knowledge, habits, and attitudes; use of real situations and health problems as content of instruction; attention to individual health needs and abilities, child initiative, and originality; types of motivation; results in terms of health habits, attitudes, and knowledge; home coöperation; and plans for the next year. Ratings also were made in terms of total impression. The rating scales were prepared for the purpose by Dr. Ruth Strang. Consideration was given in their preparation not only to local program objectives, but also to the best opinion of experts on what constitutes an adequate program of health education from the standpoint of the teachers' contribution.

The raters showed individual differences in the leniency of their judgments, but in general each seemed to apply a consistent standard. After careful statistical analysis, it was felt that the average rating of the three raters gave a fair interpretation of the practices recorded. Further experimentation with this method of evaluation is needed before its worth as an objective measuring rod can be determined. The rating scales used in this study, however, are believed to have considerable value for informal self-evaluation by teachers of

their health teaching activities. They should also provide helpful material for teachers' meetings where interest is being aroused in the improvement of health teaching. The findings, although incidental to this discussion, showed differences between Cattaraugus County and the control group which were statistically significant and in favor of Cattaraugus County. The points at which greatest differences occurred were types of motivation used, emphasis on important areas of knowledge, habits and attitudes, and use of real situations and problems, all of which were points that had received special attention in the Cattaraugus County program.

As a third approach to evaluating the health education program from the standpoint of the teachers' work in health education, it was decided to turn to the parents of the children in the rural schools which had been reached by the county-wide school health education program. The assistance of the public health nurses was solicited. A parent interview form was prepared, with the help of the nurses, to use in connection with their regular visits to homes of rural school children. Each nurse selected 10 children from representative homes of the community she served. Part I of the form contained questions on specific health practices, immunizations, and defect corrections. These were included in order to direct the parents' thinking toward specific health practices. Part II listed 6 habits, namely, hours of sleep, milk drinking, vegetable eating, cleaning teeth, handwashing before meals and after toilet. Beside each was a space to record the parents' statements regarding it, that is, whether or not a parent felt improvement was needed at the beginning of the school year, whether or not it was shown during the school year, whether or not the school had helped to bring the improvement, and other possible causes for improvement. There also was space to record the parents' answers to the question "In what ways do you believe the health work at school has helped your child in his home health habits? 'Please explain.'" Additional space was allowed for the nurse's own comments on the situation as she reviewed it.

The interview method was used for collecting the information. Written instructions were given each nurse at a meeting preceding the visits. The nurse's word only was relied upon for checking the reliability of the parents' responses. It was the nurses' belief that the mothers were truthful in their statements. When the results were summarized, it was found, that, according to the parents, improvement was shown in 76.9 per cent of the cases where it was felt improvement was needed. In 90.5 per cent of these, the schools were credited for having a part. An encouragingly large number of comments indicated that as a result of the school program the children had gained a better appreciation of the importance of good health habits and a better knowledge of why certain habits should be practised. This comment is characteristic of many: "Mary knows reasons for health practices now. Health practices have improved a great deal. Helps younger children with health habits." In some instances the mothers had a very definite conception of the ways in which the school had helped. In others there was just a general feeling that some good had been done. In a few instances the mothers felt that the school had done little or nothing and in one case the mother stated that personal hygiene had been overemphasized in the school, almost to the point of "nagging," and that the net result had been the arousing of the children's antagonisms.

In addition to the values that were gained from using these interviews as a method of appraisal, they proved to be

helpful to the nurses in their home guidance activities. Numerous problems arose for which the nurses were able to give some tangible assistance.

The evaluation studies, added to other information on the status of the schools and the socio-economic conditions of the community, helped to determine the future growth of the program as regards method, content, and materials. To illustrate, it was found through these studies that nutritional habits were poor. Milk drinking was prevalent, as might be expected in a dairying region, but diets on the whole were poor in vegetables and fruits. The economic level of farm families was known to be low and soil surveys had shown that nearly half the land is unsuited to agriculture. The multiplicity of this nutritional problem pointed to the need for extended coöperation on the part of health and school workers, agricultural extension agents, and community groups to attack the problem from every angle. Slight improvements had already occurred in the 4 years' period, which may have been associated with a county-wide emphasis on home vegetable gardens, better dietary standards for children, and school lunches. Further development of such projects was indicated.

FUNDAMENTAL PRINCIPLES OF EVALUATION

As a result of the experience in evaluation in Cattaraugus County and an analysis of literature on experiments elsewhere, several fundamental principles have been capitulated. These are listed here with the anticipation that they may be enlarged and changed as new experiments in measurement are attempted. They are as follows:

1. The objectives of a health education program should be stated in dynamic terms before evaluations are attempted.
2. Evaluations of a health education program should be made in the light of program objectives.
3. In an experimental program, plans for evaluation studies should be set up concurrently with the undertakings that are to be measured.
4. Evaluation instruments should be so constructed that they will give as objective evidence as possible of the changes which the program seeks to produce. More than one evaluation procedure may be necessary to give an adequate appraisal of a particular outcome.
5. The determination of evaluation procedures should be a coöperative enterprise.
6. In making evaluations, as many factors as possible should be controlled.
7. Summarization of findings in evaluations should be sound and based on as objective evidence as can be obtained.
8. Findings should be interpreted against broad backgrounds, including socio-economic conditions within the groups being studied.
9. Practical use should be made of the findings in order that there may be genuine program growth resulting from the studies. The evaluations themselves may be expected to have educational value for those participating in them.

Evaluation of school health education will progress as more scientific indices and methods are developed. We must turn to the medical profession and nutritionists for further knowledge on what constitutes optimal physical growth and development. We must look to the physiologist, the sanitarian, and the epidemiologist, for more tangible standards against which to check existing health practices. From our psychologists and educators must come greater assistance in the development of methods for the measurement of behavior and attitudes. On each of us, however, will rest the task of unifying these contributions into a constructive plan which is workable in the situation under study.

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Wars, Plagues, and Famine

SINCE the beginning of history, wars have produced plagues and famine. It is urgent that we in the American republics put our scientific knowledge fully to work to prevent the spreading to our own countries of the major plagues which seem inevitable in the war-torn lands. Yet we cannot avoid direct effects upon the health of our people resulting from the current conflict. Even though some impossible destiny were to stop the war tomorrow, the effects of it would be felt throughout our generation in a lowered standard of living among all peoples. With so much of the productive human energy and the natural resources of so many nations given to death and destruction, world wide economic repercussions are inevitable. Whatever consumes the wealth of the world reduces the ability of the masses of the people to provide decent standards for healthful living.—Dr. Thomas Parran, in an address at the Opening Session of the Fourth Pan-American Conference of National Directors of Health, May 1, 1940.

An Administrative Approach to Industrial Hygiene*

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ADMINISTRATIVE plans for the development of industrial hygiene at this time appear particularly important. Only within the last few years have state health departments, with one or two exceptions, given serious consideration to the organization of effective control programs in this field. It was essential to decide two points before the administrator could intelligently propose a program: (1) what industrial hygiene includes, (2) the nature and extent of the industrial hygiene problems.

Largely as a result of the recent emphasis placed on the public health approach to industrial hygiene, as contrasted with a previous approach essentially from the standpoint of the industrial employer, the definition and field of industrial hygiene have been materially expanded. The preservation of the health and welfare of the worker in its broadest sense is rapidly being accepted as the scope of industrial hygiene.

Lacking definite information concerning the number employed, exposure to various hazards, sickness or mortality records, and other essential data necessary to a conception of the industrial hygiene problem, a number of states and a few cities within the last four or five years have made comprehensive surveys. As a result of these accumulated data we are able in general to outline the problem for any state or locality. Incidentally, valuable training has been acquired by a small but strategically located group of doctors, engineers, and chemists. In other words, information essential to developing a plan of procedure is complete. The public health administrator is not faced with the problem of preparing that plan by means of which the health protection to the 50 million employees in this country will be developed during the next quarter of a century. The approach to industrial hygiene has been centered largely on a few specific diseases of a dramatic nature with no definite long-range program to include the health protection of all the workers. In view of the marked recent incentive to extend the public health aspects of industrial hygiene it is unnecessary to emphasize its importance, from every standpoint, and the responsibility which faces the public health administrator at this stage in the development of industrial hygiene. Not only the ultimate success but also the speed with which an adequate service is made available largely depends upon the plan of administrative procedure selected.

I am concerned with how we can bring to all the employed the benefits of proven means of prevention and con-

* Read at a Joint Session of the Engineering and Industrial Hygiene Sections of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 18, 1939.

trol of disease and sickness by state health department administration of industrial hygiene on a state-wide basis. We believe the essentials of a sound approach to the administration of industrial hygiene by a state health department can be briefly stated. The administration of industrial hygiene should follow those lines of procedure found fundamentally sound for the administration of other public health activities involving large populations. After many years of experience with various programs for public health administration within states, it would seem that a pattern has finally been evolved which is essentially sound and sufficiently flexible to fit the varying needs. The important program of industrial hygiene can be best administered in conformity with this pattern.

At present in Missouri there are local health services in the form of city, county, or district units that cover the entire state. This service is by no means adequate in many localities due to insufficient personnel and the necessity of including too great an area in most of the districts. Each unit provides medical, public health engineering, and nursing services.

It is the established policy that all health programs shall be integrated into the local health services, and the State Board of Health shall function in an advisory and supervising capacity. We believe administratively an industrial hygiene program for this state can be effected in this manner and that to weave industrial hygiene closely into the local health activities offers many desirable features from the standpoint of that service as well as the general public health program.

There are 1½ million wage earners in Missouri, 40 per cent of whom are engaged in industrial work which is potentially hazardous. On the basis of numbers this represents a major health problem demanding the services of all types of technically trained health personnel functioning on a well organized basis. It is inconceivable that satisfactory industrial hygiene health service, for 1½ million persons located in various parts of a state 69,420 square miles in area, could function out of the central state department of health. In order to include approximately 80 per cent of those wage earners in the more potentially hazardous industries only, it is necessary to consider 21 widely scattered counties, 5 with full-time health units, and 5 of the larger cities all of which have organized health departments.

The nature of industrial hygiene activities demands readily accessible service and a confidential relationship between the health administrator and the industrialist. On many occasions the contacts and acquaintanceships of the local health officer have simplified and been largely responsible for the satisfactory relationship with industry. Further, as the program progresses, the frequency of requests and routine nature of the control work demands the presence of local personnel, medical and engineering, to attain effective results.

Again, in placing the responsibility for industrial hygiene upon existing health officials the advantage of their general knowledge of public health and the increase in numbers of those concerned and interested in this problem will automatically occur. This integration into the local health program permits the influence of well rounded health programs to become available to the wage earning population. Thus communicable diseases, venereal disease, pneumonia, sanitation, etc., all become included with the strictly industrial diseases in the program. In fact, if a broad concept of industrial hygiene is accepted, it is difficult to conceive its successful administration except as closely integrated with the general local health program.

Another important factor in the success of an industrial hygiene program involves the assistance and coöperation of professions in the community directly or indirectly concerned with industry. The industrial engineer, nurse, and particularly the plant physician, as well as the general practitioner, constitute a potential and actual source of assistance that must be effectively brought into the picture. Their interest and coöperation can be enlisted and retained by the local health personnel far more easily than through infrequent contacts with state personnel.

From the standpoint of the local health unit there are also advantages in including industrial hygiene as a component part of the program. Industrial hygiene presents an opportunity for the local health officials to include in their activities the health of adult workers, a large important group that has received little health protection beyond sanitation in the past. The greatest opportunity for life saving and disease prevention lies at this time in the class largely represented by the wage earners. Further reduction in sickness and absenteeism among those employed represents greater efficiency and economic advantage to the employer. Consequently, through a program of industrial hygiene the local health officer probably for the first time is in a position to meet and favorably impress the industrialists and business men of his community with the importance of public health. Such an excellent, as well as unusual, opportunity to gain public support from the most influential sources is seldom otherwise available to the health official.

The approach through industry to the health of the wage earner offers the same advantages inherent in school health programs, namely, large numbers readily accessible and, from the community standpoint, a group whose health is vitally important. The opportunities for case finding among the adult population seem excellent as the industrial hygiene program progresses to the stage of physical examination. In addition, better morbidity reporting in cooperation with industry has been developed in one or two instances which is of considerable general health importance and particularly essential to more effective industrial hygiene control.

In view of these advantages, many of which have been actually experienced in our early work, the following administrative procedure was developed for the promotion of an industrial hygiene program in Missouri:

There has been organized in the central office of the State Board of Health a small specialized but complete industrial hygiene service consisting of a doctor, an engineer, and a chemist, with field and central laboratory equipment. Since the industrial hygiene activities are decentralized and integrated into local health units and involve medical as well as engineering problems, the administration of industrial hygiene work on the part of the State Board of Health is placed under the Division of Local Health Administration and Division of Public Health Engineering.

This plan is unique, but under our circumstances appears entirely logical. It is succeeding in Missouri possibly because we have already recognized the need and importance of close administrative coördination between these two divisions in practically all our programs dealing with field activities of a public health engineering significance. For the sake of effective central organization necessary to promote accomplishments in the field, where the actual work must be done, we are convinced that fewer state department divisions, and better coördination of existing divisions, are absolutely essential.

As rapidly as possible, and in accordance with the importance of the problem, services are being established

in the district, county, and city health units. The local service established naturally depends upon the seriousness of the problems as well as the per cent of population industrially employed. In a number of instances one or more of the personnel in the local health unit are required to spend full time in this service. In other cases the existing full-time county or city medical officer and public health engineer are able to control industrial hygiene effectively on a part-time basis. Lastly, in certain areas industries are so few that the district personnel with some aid from the central office is able to cope with the problem.

The function of the State Board of Health in this program is largely educational, promotional, and supervisory. Its part of the program is to promote among the existing health units an interest in industrial hygiene, and train the personnel of such units in methods for developing a definite program, procedure for the control of the health and welfare of the wage earner, and supervise the work of local health units after the service has once been established. A further important function of the State Board of Health involves maintaining close coöperative relationship with the other official and nonofficial agencies that are concerned with the wage earner's welfare.

The results in Missouri in developing this plan of administrative approach to industrial hygiene reinforce our belief in its fundamental soundness. In the largest industrial center the City of St. Louis, we have subsidized two full-time engineers who are working in conjunction with the existing medical and laboratory facilities on a definite industrial hygiene program for that area. In brief, during the past three years the St. Louis program has covered such phases of industrial hygiene as silicosis in the foundry industry, health hazards in electroplating, a study of lead exposure in a large plant, and many miscellaneous surveys and control activities.

In St. Louis County, having a large industrial population, one full-time public health engineer has been assigned to industrial hygiene work in coöperation with the existing medical, engineering, and nursing personnel. In the last year the St. Louis County program has included: training local personnel including one full-time industrial engineer; surveys, including quantitative studies in 37 plants, employing approximately 4,000 persons, and follow-up reports with recommendations; improvements involve about 10 per cent of employed persons; and a detailed study of limestone quarries.

In another county having relatively minor industrial hygiene problems the existing public health engineer has been given training, and with the county medical health officer is undertaking a definite industrial hygiene program which requires only a part of his time. In a number of instances studies and reports on individual industries were made upon request in various localities in the state. The work was undertaken in every case in company with the district engineer in order to train local health personnel and establish a background for future check-up.

As rapidly as finances and personnel are available, and guided by our past experiences, it is intended to develop industrial hygiene services of a type justified by the extent of the problem in those areas where such a program is needed and will become a valuable intricate part of existing public health activities. We appreciate that this plan of administration will develop the service slowly, which is probably in the long run desirable and certainly no departure from the usual experience in public health activities. We believe that as eventually developed it will afford an adequate health service to the wage earner, further will have the ad-

vantage of being thoroughly integrated into the general pattern of our public health program for any particular area, and will be sufficiently flexible to serve the particular needs of the locality concerned. Probably most important of all, this plan of administration is so designed that it can be expanded, without the necessity of any radical change, to provide ultimately to all wage earners of the state effective health protection.

A Question of Space

"OUR readers may notice that the whole of this issue of *Public Health* is printed in the smaller of the two sizes of type which have been used hitherto. . . . The use of the present size of type goes some way towards solving for us the accentuated problem of getting the quart into the pint pot, and we hope to find adequate 'living room' for important contributions in the future as in the past. We do, however, take this opportunity of reiterating our appeal to contributors to cut out all redundant verbiage before they submit their papers. Such coöperation on their part will save much 'blue-pencilling'—both verbal and physical—on the part of the Editor."—Editorial, *Public Health*, London, May, 1940, p. 165.

To What Degree Are Mortality Statistics Dependable?*

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TO Cabot [1] should go much of the credit for stirring up general interest among progressive American physicians in checking clinical diagnoses by postmortem findings in fatal cases of disease. It seems strange, in view of this known interest, that so few studies following his pattern have ever reached publication. Analogous studies with a view to judging the possible effect of erroneous clinical diagnoses upon mortality statistics have apparently been even less frequently made, though their value to public health people and others concerned with such data can hardly be questioned.

The first published study of this sort known to us was made in 1934 by the senior author.[2] It was based on 1,805 New Haven Hospital autopsy records and their corresponding case histories. Incomplete information has come to us about a 1937 German study [3] of 8,182 cases, which was apparently somewhat similar, though not enough so to guarantee that a comparison of findings would be fruitful.

We have available in the Los Angeles County General Hospital an unexcelled field for such a study. About 2,000 autopsies a year are performed in that institution, and good records are kept. Dr. Newton Evans, Chief Pathologist, made these records available under proper professional safeguards; and this report is based on the records of 8,080 cases that came to autopsy during the years 1933 to 1937, inclusive. No coroner's cases or stillbirths were included.

Before beginning the report of the study proper, we should explain two peculiar problems facing diagnosticians in the Los Angeles County General Hospital. In the first place, many of the patients are Mexicans, people of some other foreign nationality, or people alone in the world. Because of language difficulties or because nobody but a very ill or almost moribund patient can be found to tell the story, it is frequently impossible to obtain a satisfactory history, which obviously often makes the matter of arriving at an accurate diagnosis extremely difficult.

In the second place, many of the patients enter the hospital only when death is near, and there is limited time for the physical and laboratory examinations necessary for correct diagnosis. Thirty-eight per cent of the cases we studied had been in the hospital 48 hours or less before death, and the

* Read before the Vital Statistics Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 20, 1939.

TABLE 1

Ante-mortem Diagnoses Checked by Autopsy

Code No.	Disease Classification *	Total Cases	Correct Diagnoses	Per cent Correct
7	Measles	34	34	100
8	Scarlet fever	35	35	100
9	Whooping cough	45	44	98
10	Diphtheria	97	95	98
13b	Bacillary dysentery	28	26	93
16	Acute poliomyelitis	61	56	92
18	Epidemic cerebrospinal meningitis	82	79	96
23	Tuberculosis of the respiratory system	668	604	90
24	Tuberculosis of the meninges	57	51	89
32a	Acute disseminated tuberculosis	51	30	59
34	Syphilis	199	151	76
36	Purulent infection—septicemia	40	25	62
43	Mycoses	27	25	93
45	Cancer of the mouth and pharynx	61	61	100
46	Cancer of the digestive tract and peritoneum	480	426	89
47	Cancer of the respiratory system	99	71	72
48	Cancer of the uterus	114	106	93
49	Cancer of other female genital organs	33	30	91
50	Cancer of the breast	66	64	97
51	Cancer of male genitourinary organs	99	71	72
53	Cancer of other organs, unspecified	119	84	71
54d	Nonmalignant tumors of the brain	28	19	68
55d	Tumors of the brain, unspecified	47	35	74
59	Diabetes mellitus	139	135	97
62	Pellagra	33	31	94
71a	Pernicious anemia	34	24	71
72a	True leukemias	44	35	79
75	Alcoholism	70	61	87
78	Nonepidemic encephalitis	29	14	48
79a	Simple meningitis	75	59	79
82a	Cerebral hemorrhage	251	185	74
82b	Cerebral embolism and thrombosis	171	130	76
82c	Softening of the brain	32	5	16
89a	Diseases of the ear	111	75	68
89b	Diseases of the mastoid process	71	56	79

* Not all cases studied are listed here, only those with more than 25 cases per class.

errors in ante-mortem diagnoses in this group were approximately twice as frequent as among the group that were in the hospital more than 48 hours before death.

Our study was aimed strictly at the mortality statistics target and was not intended as a test of the diagnostic ability of hospital physicians from the point of view of clinical medicine. For that reason our criteria of correctness of or error in the stated cause of death were taken from the last (1929) edition of the *Manual of the International List of Causes of Death;* and, whenever two or more causes were listed as ante-mortem diagnoses or post-mortem findings, or both, precedence was given to one or another in accordance with the rules in the *Manual of Joint Causes of Death.* We had for comparison, therefore, a list of deaths charged to causes as they would have been had no autopsies been performed, and the same list charged to causes as found at autopsy, these causes being those regularly listed in statistics on mortality.

In Table 1 we present the figures as we found them. All the cases represented 176 of the causes listed in the *Manual;* but for the sake of brevity and because the general principle is as well demonstrated by an abridged report, we have included in the table only those classes represented by more than 25 cases, the number of such classes being 69. The totals at the foot of the table, however, represented *all* the cases studied and not simply those listed.

As might be expected, the errors in

TABLE 1—(Cont.)

Ante-mortem Diagnoses Checked by Autopsy

Code No.	Disease Classification *	Total Cases	Correct Diagnoses	Per cent Correct
91a	Acute endocarditis	60	45	75
94b	Diseases of the coronary arteries	219	145	66
95b	Other and unspecified diseases of the heart	631	526	83
97	Arteriosclerosis	85	56	66
106b	Chronic bronchitis	51	15	29
107a	Bronchopneumonia	232	160	69
108	Lobar pneumonia	277	196	64
110	Pleurisy	29	24	83
114b	Other lung diseases, including gangrene	47	31	66
115a	Diseases of the pharynx and tonsils	33	25	76
117a	Ulcer of the stomach	136	105	77
117b	Ulcer of the duodenum	57	31	54
120	Diarrhea and enteritis, over 2 years	28	8	29
121	Appendicitis	177	160	90
122a	Hernia	76	60	79
122b	Intestinal obstruction	109	96	88
123	Other diseases of the intestines	39	19	49
124b	Cirrhosis of the liver	77	51	66
125b	Other diseases of the liver	33	17	51
126	Biliary calculi	30	17	57
127	Other gall-bladder diseases	56	41	73
130	Acute nephritis	29	20	69
131	Chronic nephritis	99	70	71
133	Other diseases of the kidneys	46	20	43
134	Urinary calculi	26	21	81
136a	Stricture of the urethra	27	17	63
137	Diseases of the prostate	159	130	82
139b	Diseases of the ovaries, etc.	47	31	66
140	Septic abortion	27	24	89
152	Acute abscess, phlegmon	36	31	86
157d	Miscellaneous congenital abnormalities	57	49	86
158	Congenital debility	27	25	93
159	Prematurity	349	345	99
200b	Undetermined	27	15	56
	Totals	† 8,080	† 6,365	79

* Not all cases studied are listed here, only those with more than 25 cases per class.
† These totals include *all* cases studied, not simply those listed above.

some classes appear much larger than in others. Taking the 8,080 cases as a whole, however, the 79 per cent of success in ante-mortem diagnoses which they indicate does not seem good enough to warrant the use of ordinary mortality data as the basis for some of the fine-spun calculations and predictions that we have seen based on such data. We make this broad statement because we doubt that the average per cent of success achieved elsewhere throughout our country exceeds, or even equals, that attained in the Los Angeles County General Hospital, though there may be some places that excel it.

We estimate a somewhat greater percentage of success in unautopsied cases than in autopsied cases, but not much greater, because requests for autopsy routinely follow all deaths in this hospital and the frequent tendency for autopsies to be performed only on cases that present great difficulty in diagnosis is thereby minimized.

The whole question, however, has two brighter aspects. First, whenever autopsies are performed nearly all of the previous errors are corrected; and the deaths are in such instances charged to their proper causes. In the above mentioned hospital, about 40 per cent of deaths, some months considerably more than that, are followed by autopsies, so the correction figure from this source alone may reasonably be as-

sumed to raise the total percentage of success well up toward 90. This, of course, cannot be said of all deaths that occur in the United States.

Second, in health publications and in various other phases of health education, we rarely use the classes of causes of death as given in the *Manual*. Broad as these classes seem to the clinician, they are much too narrow for effective publicity. The Los Angeles County Health Department follows a practice that is quite common, and in its *Annual Report* gives a list of what people often call the "Ten Leading Causes of Death." In last year's report the list was as follows:

1. Diseases of the heart
2. Cancer and other malignant tumors
3. Nephritis
4. Cerebral hemorrhage, embolism and thrombosis
5. Tuberculosis
6. Violent and accidental deaths
7. Pneumonia
8. Other diseases of the circulatory system
9. Congenital debility and malformations
10. Suicide

When grouped into these larger classes, and when the ante-mortem diagnosis which fell anywhere within the class to which the actual cause of death belonged was not charged as an error, the percentage of successful clinical determinations of causes of death rose to approximately 90, as indicated partially by the first three columns of figures in Table 2. Assuming, as is reasonable, that about 40 per cent of all diagnostic errors were corrected by autopsy, the causes of death as stated on death certificates issued from the hospital were about 93 or 94 per cent correct from this broad point of view.

In Table 2 we list the 5 large groups most commonly discussed among the 10 leading causes of death. To get an idea of how far the true picture in any group varies from that which would be given if no autopsies were performed, we must obviously compare the total number of clinical diagnoses rightly or wrongly assigned to that group with the total number of autopsy-proved cases properly belonging to that group. For example, if no autopsies were performed, 808 of the 8,080 cases would have been charged to tuberculosis, while autopsies showed that 834 cases should have been so charged, and so on.

A careful study of the records shows that mistakes in clinical diagnoses, which of course may be in either direction, go a long way toward cancelling each other. We do not say this to excuse mistakes, but after all it does leave us with a situation not nearly as bad as it might seem. The most questionable feature is an apparent tendency to attribute deaths to some of the more frequent causes when certain symptoms point that way, and not to keep on studying until everything possible has been done to check the correctness of the diagnoses. In our study the most outstanding evidence of this tendency was found in the "apoplexy group,"

TABLE 2

Special Study of Five Large Disease Groups

Code Numbers Covered by the Disease Group	*Name of the Disease Group*	*Cases Proved by Autopsy*	*Correct Clinical Diagnoses*	*Per cent of Correct Clinical Diagnoses*	*Total Clinical Diagnoses*	*Net Percentage of Error**
23 to 32c	Tuberculosis Group	834	749	90	808	3
45 to 53	Cancer Group	1,087	963	89	1,050	4
82a and 82b	Apoplexy Group	422	384	90	501	19
91a to 95b	Heart Disease Group	937	877	94	972	4
107a to 109	Pneumonia Group	521	429	82	518	1
	Total	3,801	3,402	90	3,849	1

* Some of these errors were errors of excess, others of deficit.

where considerable numbers of cases of brain neoplasms, cerebral arteriosclerosis, and several other symptomatically similar conditions had been diagnosed as cerebral hemorrhage, thrombosis, or embolism. This was the only group, however, in which the net error exceeded 5 per cent.

We conclude from our study, therefore, that caution should be exercised in talking about trends and making comparisons based on small differences in reported death rates from specific causes; but we are certainly justified in the main when we list the leading causes of death in the order that we do and talk to the public about their relative importance and what may be done to meet the problems which they present.

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The Function of Government

IT is a function of government to preserve the person as well as the property of man . . . and there can be no national progress except through promoting the health and welfare of the citizens of the Nation—Senator James E. Murray, *U. S. Senate Report on the National Hospital Act of 1940.*

Mortality in the Children of Tuberculous Households*

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IT is the purpose of this paper to present an analysis of the risk of mortality in the children of families containing an adult with the diagnosis of pulmonary tuberculosis. The analysis is limited to unselected children entering the household under 15 years of age, and their mortality has been studied only to age 20.

The records for analysis are those of an outpatient clinic for childhood tuberculosis conducted since 1928 at the Harriet Lane Home of the Johns Hopkins Hospital. Children are admitted to this clinic during infancy, and for each child a family record is kept. Such records contain a complete roster of each household in question, going back to the date of its establishment, and supplying data for the past and present health of each member of the household with respect to tuberculosis. To obtain a date at which intrafamilial contact might be considered as having begun, careful inquiry was made to find out as accurately as possible in each instance the time, preceding diagnosis, at which symptoms first appeared in the adult. Observations on these families have covered varying periods of time, and for the purpose of this paper ended December 31, 1937.

There are 285 households represented, of which 138 are white and 147 are colored, and the total number of unselected children included is 1,383.

Of the 285 households represented, 248 contained a case of sputum-positive or fatal pulmonary tuberculosis in an adult; while in the remaining 37 the sputum of the diseased adult was either repeatedly negative, or its status unknown. The proportion of families exposed to cases not classed as sputum-positive or fatal was about the same in both races. Since the number of individuals coming from families containing the less infective type of disease was small, 159 out of a total of 1,383, it proved impractical to deal with them separately, and accordingly the entire group of households have been considered together.

For some families the period of intrafamilial contact was long, for others short, and about 15 per cent of the white children and 22 per cent of the colored escaped known contact altogether. Every effort was made to get the tuberculous adult out of the home as soon after diagnosis as possible. No attempt has been made in this study, however, to relate duration of contact and mortality. The purpose was to measure the difference in mortality in these families before and after the establishment of known exposure to tuberculosis.

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 20, 1939.

TABLE 1

Age-specific Mortality from All Causes and from Tuberculosis in 523 White and 594 Colored Children After the Onset of Known Contact with Adult Pulmonary Tuberculosis

Age	Person-years	Deaths: All Causes: Number	Deaths: All Causes: Rate per 1,000	Deaths: Tuberculosis: Number	Deaths: Tuberculosis: Rate per 1,000
		White			
0– 1	168.63 *	8	47.44	2	11.86
1– 4	929.25	14	15.07	4	4.30
5– 9	1,132.50	6	5.03	1	0.88
10–14	745.00	0	.....	0	....
15–19	398.00	4	10.05	3	7.54
		Colored			
0– 1	134.06 *	16	119.35	8	59.68
1– 4	808.75	28	34.62	15	18.55
5– 9	1,051.25	4	3.80	4	3.80
10–14	721.25	2	2.77	2	2.77
15–19	370.00	9	24.32	8	21.62

* In calculating the life-experience of children observed for part of the first year of life, age was recorded as under 3 months, 3–6 months, and 6 months to 1 year. The sum of the average experience in these shorter intervals was added to the experience of infants observed their entire first year, to give the total life-experience under 1 year of age.

Accordingly, mortality from all causes and from tuberculosis, derived by a modified life-table method, was determined for the 1,383 children, the experience of each individual being divided according to whether it fell prior or subsequent to the onset of contact with a tuberculous adult within the household. The application of life-table methods to clinical data was developed largely by Dr. Frost and the technic is already familiar to many epidemiologists. The steps in this procedure as applied to the data of this study cannot be described in this brief note, but will appear in the publication of the full-length paper.

Age-specific mortality rates for the 523 white and 594 colored children after the onset of exposure within the family are shown in summary form in Table 1. Death rates for all causes and for tuberculosis are shown separately. The rates given are annual rates, and where they apply to an age period of more than 1 year, they are the mean death rates experienced in each year throughout that age period.

Table 1 indicates that the colored tend to suffer a considerably higher mortality than the white. It also shows that for both races, the highest mortality is encountered during the first year of life, and this is true for tuberculosis as well as for all causes. There is a sharp decline in mortality in children of both races, aged 1–4 years, and the lowest level of all is maintained fairly uniformly from 5 to 14 years of age. Thereafter, between 15 and 20 years of age, mortality from tuberculosis suddenly increases in both races. In the colored the increased risk at this later age approximates the high rate observed for children aged 1–4 years, but nowhere nearly approaches the tuberculous mortality observed for the first year of life. The white death rate from tuberculosis for the years 15–19 lies numerically between that observed for infants under 1 year and the rate for children of this series aged 1–4 years.

Mortality from tuberculosis in infants under 1 year of age who have had contact with tuberculosis is all the more striking because our records show that infants under 1 year in the tuberculous households of our series showed the lowest prevalence of positive tuberculins. In this series deaths from tuberculosis have not occurred in the tuberculin-negative. Coincident with the sharp rise in prevalence of infection noted in exposed children after 1 year of age, mortality from tuberculosis paradoxically begins to decline. It seems clear that no period in childhood suffers so high a case fatality as the first year of life.

It is of special interest to measure the whole mortality risk experienced in passing from birth to age 20 after tuberculosis has made its appearance in these households. In summary form the probabilities of dying, or the *cumulative* mortality risk from birth up to age 20 are shown in Table 2.

The indicated deaths per 1,000 from all causes up to age 5 are 105 for white children and 235 for colored. To age 20, cumulative mortality is for the white 183 and for the colored 349 per 1,000. The tuberculosis mortality risk, similarly computed, is for the white 83 and for the colored 247 per 1,000 to age 20.

Comparing the rates for the colored and for the white, it is seen that with considerable uniformity between birth and age 20, the colored have a probability of dying from all causes which is twice that for white children. With respect to tuberculosis, the disparity of risk between white and colored is even greater. Before the end of the first year of life, colored children exposed to tuberculosis within the family are 5 times more likely to die than are white children. This difference is more nearly fourfold in mid-childhood, but stands at 4.7 at age 15. That is, exposed colored children are 4.7 times more likely to

TABLE 2

Mortality Risk, Age-specific and Cumulative, from Birth to Age 20, for 523 White and 594 Colored Children Observed from the Onset of Known Household Contact with Adult Pulmonary Tuberculosis

	Mortality Rates per 1,000			
	All Causes		Tuberculosis	
Age	In Current Period m_x	In Current and All Previous Periods q_x*	In Current Period m_x	In Current and All Previous Periods q_x*
	White			
0– 1	47.44	46.34	11.86	11.81
1– 4	15.07	105.28	4.30	29.76
5– 9	5.30	127.47	0.88	33.70
10–14	....	127.47	....	33.70
15–19	10.05	183.18	7.54	83.47
	Colored			
0– 1	119.35	112.63	59.68	57.95
1– 4	34.62	234.82	18.55	129.52
5– 9	3.80	248.46	3.80	145.03
10–14	2.77	260.00	2.77	158.15
15–19	24.32	349.38	21.62	247.27

* The cumulative rate q_x represents the probability of dying some time between birth and the end of the age-period in question, in contrast to the average annual age-specific rate designated here as m_x.

TABLE 3

Distribution in Calendar Years of Life-experience in Each Age Period in Tuberculous Families Before and After Establishment of Known Contact

White Families

Year	Age 0–1	1–4	5–9	10–14	15–19
	Person-years Before Contact				
1901–1905	6.51	11.79	.....	.....	.....
1906–1910	9.30	29.03	17.45	.....	.....
1911–1915	22.78	42.64	42.71	17.20	.....
1916–1920	59.98	145.16	54.20	45.87	14.76
1921–1925	92.07	273.09	159.84	59.73	48.43
1926–1930	102.30	232.73	187.86	100.82	27.67
1931–1935	53.02	146.07	84.74	44.91	14.76
1936–1937	6.04	17.24	14.70	11.47	1.38
Total	352.0	897.75	561.50	280.00	107.00
	Person-years After Contact				
1911–1915	0.50	0.50	2.03	1.02	....
1916–1920	0.50	8.46	7.10	9.20	9.24
1921–1925	20.98	58.53	28.82	9.73	10.77
1926–1930	78.33	288.26	271.51	126.57	44.31
1931–1935	59.36	490.92	603.68	443.44	222.65
1936–1937	8.96	82.58	219.36	155.04	111.03
Total	168.63	929.25	1,132.50	745.00	398.00

TABLE 4

Distribution in Calendar Years of Life-experience in Each Age Period in Tuberculous Families Before and After Establishment of Known Contact

Colored Families

Year	Age 0–1	1–4	5–9	10–14	15–19
	Person-years Before Contact				
1901–1905	2.77	9.27	1.90	....	....
1906–1910	12.04	25.04	12.82	2.34	....
1911–1915	24.08	55.17	33.72	18.72	3.67
1916–1920	53.71	139.08	80.73	35.57	18.84
1921–1925	101.40	280.93	193.28	88.92	47.78
1926–1930	132.88	362.52	290.39	152.56	70.29
1931–1935	109.73	285.10	163.12	137.35	57.89
1936–1937	20.14	49.14	41.79	14.04	11.03
Total	456.75	1,206.25	817.75	449.50	209.50
	Person-years After Contact				
1911–1915	0.51	.....	....	.....	.....
1916–1920	6.14	15.41	1.60	.....	.....
1921–1925	8.24	28.75	35.29	11.44	.....
1926–1930	39.58	166.66	166.05	99.67	43.44
1931–1935	63.85	470.56	611.17	416.56	217.98
1936–1937	15.74	127.37	237.14	193.58	108.58
Total	134.06	808.75	1,051.25	721.25	370.00

die of tuberculosis between birth and age 15 than are exposed white children.

One might suppose that a direct comparison could be made in these families between mortality rates computed for individuals after the establishment of contact and rates prevailing before its known establishment. But this would be an unsound procedure in this instance because most of the life-experience prior to contact occurred earlier in time than did the life-experience after known exposure to tuberculosis began; and during the passage of time, death rates have been falling in Baltimore as in most large cities. This decline in death rates in recent years has been especially conspicuous in infant mortality and in mortality from tuberculosis, and is sufficient to mask completely the rôle played by intrafamilial contact in the more recent time-period when exposure took place.

Therefore, the life-experience of each individual, both before and after the onset of intrafamilial exposure to tuberculosis, had to be distributed in calendar time, and was collected into person-years of experience for 5 year periods from 1901 to 1937, the calendar interval for which these households supplied vital data. Tables 3 and 4 show these distributions for the two races.

The prevailing city rates for each of these semi-decades were then applied to the person-years of life-experience falling within the semi-decades, and by this means an expected number of deaths was obtained for comparison with the number of deaths actually observed. In this way observed mortality both before and after the onset of contact could be evaluated correctly, using the risk in the community at large as a basis for comparison.

The expected number of deaths from all causes at prevailing city rates, and the deaths actually observed at each age before and after the establishment of known contact are shown in Table 5. Considering first the experience before contact in the white families: the number of deaths from all causes observed in children under 1 year of age falls considerably below the expected number; and yet beyond 1 year of age, observed deaths for the ages 1–19 significantly outnumber the expected. Under-enumeration of deaths in early infancy probably accounts for this inconsistency. In a study where data are secured in retrospect for an interval of time extending from the date of establishment of household to the date when a case of tuberculosis brought about epidemiological inquiry, there are many pitfalls in enumeration of former members of the household, however carefully the field work is done. Such data are probably the least reliable with respect to neonatal deaths.

If children under 1 year of age are excluded, it can be seen from Table 5 that the white families of this study, prior to contact, showed a total mortality 1.9 times greater than expected had the city rates prevailed. This is not unexpected, for a public dispensary attracts the poorer white families who live under conditions considerably below those of the average white city resident.

The colored families prior to known contact with tuberculosis showed 48 deaths from all causes during the first year of life, when 69 were expected; and between 1 and 4 years of age 13 children died, when 23 deaths from all causes were expected. If under-enumeration of deaths in early infancy played a rôle in the collection of data from white families, such an effect might be expected in more exaggerated form in the colored where larger households and a higher infant mortality would tax the memory of the informant more severely. It is probable, therefore, that under-enumeration played a considerable rôle in the unexpectedly low mortality recorded for colored chil-

TABLE 5

Observed and Expected Deaths from All Causes in White and Colored Tuberculous Families Before and After the Onset of Known Contact

	Before Known Contact			*After Onset of Known Contact*		
	Deaths		*Ratio of Observed to Expected*	*Deaths*		*Ratio of Observed to Expected*
Age	*Expected*	*Observed*		*Expected*	*Observed*	
			White			
0– 1	32.26	27		12.22	8	
1– 4	8.15	16		5.60	14	
5– 9	1.38	4		2.10	6	
10–14	0.49	0		1.05	0	
15–19	0.29	0		0.78	4	
1–19	10.31	20	1.94	9.53	24	2.52
0–19	42.57	47		21.75	32	
			Colored			
0– 1	69.20	48		16.29	16	
1– 4	23.32	13		8.82	28	
5– 9	3.35	3		2.70	4	
10–14	1.76	3		2.25	2	
15–19	1.69	1		2.53	9	
1–19	30.12	20	0.66	16.30	43	2.64
0–19	99.32	68		32.59	59	

TABLE 6

Observed and Expected Deaths from Tuberculosis in White and Colored Tuberculous Families Before and After the Onset of Known Contact

	Before Known Contact			*After Onset of Known Contact*		
	Deaths		*Ratio of Observed to Expected*	*Deaths*		*Ratio of Observed to Expected*
Age	*Expected*	*Observed*		*Expected*	*Observed*	
			White			
0– 1	0.334	0		0.104	2	
1– 4	0.452	0		0.283	4	
5– 9	0.061	0		0.070	1	
10–14	0.033	0		0.043	0	
15–19	0.071	0		0.140	3	
1–19	0.617	0		0.536	8	
0–19	0.951	0	....	0.640	10	15.6
			Colored			
0– 1	1.536	1		0.380	8	
1– 4	3.235	2		1.423	15	
5– 9	0.822	2		0.650	4	
10–14	0.658	2		0.906	2	
15–19	0.930	1		1.408	8	
1–19	5.645	7		4.387	29	
0–19	7.181	8	1.11	4.767	37	7.76

dren under 1 year of age prior to contact; and it is altogether possible that this error was extended, and operated to a lesser degree in the record of deaths from all causes for children aged 1 to 4.

Excluding children under one year of age, it is found on referring to Table 5 that prior to contact the observed mortality from all causes in the colored was two-thirds that expected had the city rates prevailed. This difference between expected and observed number of deaths is not quite large enough to exclude the operation of chance alone; and it is possible that the figure for observed deaths represents a chance variation from city experience. If the difference is real, and under-enumeration plays no significant rôle beyond 1 year of age, then the colored of our series prior to contact appear to have represented a standard of living and a risk of mortality somewhat more favorable than the average colored family of the city of Baltimore.

Subsequent to the onset of intrafamilial contact with pulmonary tuberculosis, the observed total mortality for ages 1–19 becomes more than twice that expected at prevailing city rates. It will be seen from Table 5 that for white families the ratio of observed to expected deaths from all causes rises from 1.94 before known contact to 2.52 after the beginning of contact, an increase of only 30 per cent in the ratio. In contrast to the white, the colored families show a marked increase in the ratio of observed to expected mortality following the establishment of exposure to tuberculosis. The number of deaths from all causes observed for the colored, aged 1–19, subsequent to contact, is 2.64 times greater than the number of deaths expected at city rates. If the ratio of 0.66 prior to contact is correct, then the ratio of observed to expected deaths, after contact began, is 4 times greater, representing a 300 per cent increase. Even if we suppose a pre-contact ratio of 1 to be more nearly correct, the increase in observed mortality over that expected, as indicated by the ratio, remains striking.

Thus in measuring mortality from all causes in these tuberculous households, it has been assumed that the relationship between familial hazard and community hazard should remain constant both before and after the beginning of contact, unless tuberculosis within the family upsets this relationship.

Turning to mortality from tuberculosis in these households, it will be seen from Table 6 that prior to contact less than 1 death from tuberculosis would have been expected at prevailing city rates in the life-experience of children of the white families up to age 20. No deaths from tuberculosis occurred. In the colored from birth to age 20, 7 deaths from tuberculosis were expected and 8 occurred. Because there is no evidence for under-enumeration of deaths from tuberculosis in early infancy, the ratios of observed to expected mortality from tuberculosis, before and after exposure began, have been calculated for the whole of the first 20 years of life and are shown in Table 6.

After the establishment of known contact, white children under 20 years of age suffered 10 deaths from tuberculosis when only 0.6 death was expected. Thus the observed mortality from tuberculosis, once contact began, was 15.6 times greater than the community mortality from tuberculosis.

In the colored families 37 deaths from tuberculosis were observed subsequent to contact and only 4.8 were expected, the observed mortality being 7.8 times greater than that anticipated, had the city rates been in force. The lower ratios of observed to expected deaths from tuberculosis for the colored, as shown in Table 6, are due solely to their higher community attack rate from

tuberculosis, which increases the number of expected deaths forming the denominator of the ratio.

In conclusion, this study of mortality in 138 white and 147 colored families exposed to tuberculosis indicates that while the death rates from tuberculosis are strikingly increased over normal expectancy in both races, tuberculosis mortality in the white children of our series was not sufficiently high to increase in a marked way the total mortality from which such families already were suffering. The colored children, however, have a mortality from tuberculosis three or four times greater than the white, once exposure has been established, and these deaths from a specific cause are numerous enough to increase very greatly the total mortality in these families. These racial comparisons indicate that familial contact with tuberculosis is much more serious for the colored than for the white. It follows that departments of health can afford to focus their attention more sharply upon prompt provision for the tuberculous adult of the colored race in order that his familial associates may have an improved opportunity to escape the disease which remains the leading cause of death in the colored race.

NOTE: The author acknowledges gratefully her debt to the late Dr. W. H. Frost, who planned the study and guided much of the analysis. The present paper represents an extension of a preliminary unpublished compilation made by Dr. James Watt at the School of Hygiene and Public Health in 1936.

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ADMINISTRATIVE CONTROL OF STATE HEALTH DEPARTMENTS

THE usual position of the state health department in the framework of state government is both appropriate and unique. Since these departments are vested by law with wide authority over communities and individuals, they are generally responsible to the chief executive of the state, and through him to the people.

This system has been in successful operation since the organization of the first state board of health in 1869. In most instances, state health departments consist of a board of health or council appointed by the governor, and an executive state health officer who is appointed in about half the states by the board, and in the remainder directly by the governor. In either event, the chief executive properly shares the responsibility for the efficient administration of the public health activities of the state.

In recent years there has been an unfortunate tendency in some states to place the health department or the health officer under the administrative jurisdiction of another state department, such as social welfare. Almost invariably the effects of such an unwise procedure are detrimental to the best interests of public health work, since the submergence of the health department in another executive branch of the government removes desirable contact with the governor and tends to minimize the real importance of an effective state health program.

In an official declaration on desirable standard minimum functions and suitable organization of health activities, the American Public Health Association has emphasized the principle that, " the state or city health officer should be directly responsible either to his board of health, or to the chief executive of the governmental area concerned." [1]

It has been aptly stated that government is organized for the purpose, among others, of safeguarding the health of the people, and that the protection and preservation of the public health has been recognized from time immemorial as one of the necessary duties and primary functions of the state.[2] In order that

this important governmental responsibility may be discharged most efficiently, it is essential that every state health program should be administered by a competent, independent executive department of the government, amenable only to the chief executive of the state.

Legislative proposals for any system other than this are unwise and should be vigorously opposed.

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SUMMER DIARRHEA AND HORSE-DRAWN VEHICLES

PUBLIC health is sometimes promoted by trends or measures in which that objective was not considered. A striking instance is the reduction of malaria in Missouri, Arkansas, and other states, where huge drainage ditches have been put down to reclaim land for agricultural purposes. It is said that in southern Illinois, where somewhat the same process has been going on, the quinine bottle was once put on the table as regularly as the sugar dish, yet even for teaching purposes one cannot count on material in some districts in which malaria was formerly prevalent.

Graham-Smith has been studying the relation of horse-drawn vehicles to summer diarrhea in England. In 1929, he drew attention to the decrease in deaths from summer diarrhea of infants and attributed this to the increased use of automobiles and accompanying decline in horse-drawn vehicles. He supplements his former findings in a report [1] so extensive and exact as to leave little question of the relation of the decline in summer diarrheas to the falling off in the number of horse-drawn vehicles, and the consequent accumulations of horse manure as breeding places for flies.

The observations cover 37 years, at the beginning of which horse manure was stored even for weeks near urban stables, while at the end owners were compelled to remove it and other refuse promptly. A chart shows for 1901–1937 the departures of the mean air temperature in the third quarter of each year from the average for 50 years (1861–1910), which are correlated with the number of horse-drawn vehicles licensed 1929–1939, and the death rate from diarrhea of children under 1 year of age per 1,000 live births for England and Wales from 1901 to 1905, and from 1929 to 1939. While there was great fluctuation in the death rate during the period 1901–1922, except for 4 years, both the rises and the falls corresponded with the mean air temperatures of the third quarters of the year, but from that time on the decline in the death rate corresponded closely to the decline in the number of horse-drawn vehicles. From 1906 to 1937 the number of horse-drawn vehicles licensed fell from 411,334 to 14,195, the fall being even more rapid than the death rate. During the same time the motor vehicles increased from 67,115 to 2,706,555.

At the beginning of the period under observation (1901–1905) the death rate from summer diarrhea in children under 1 year of age per 1,000 live births was 25.4, and for the last five years (1933–1937) 5.3. In 7 of the last 16 years conditions were very favorable for fly breeding, yet there was little evidence of any effect on the spread of summer diarrhea.

The prevalent opinion practically all over the world was that high temperatures were responsible for intestinal troubles, and Mellanby, in 1916,[2] as the result

of an experimental investigation of the subject, felt that the high temperature in itself might be the cause of the disease.

In commenting on the situation, Graham-Smith says that previous to the outbreak of the World War in 1914, little attention had been paid to the possibility of the dissemination of disease through flies, and attributes the recognition of their agency to observations made where large numbers of horses were gathered for army purposes. This is somewhat surprising since the agency of flies as vectors of intestinal diseases, notably typhoid fever, was recognized in 1898, during the Spanish-American War, and the name "typhoid fly" was given. A commission consisting of Walter Reed, Victor C. Vaughan, and W. O. Shakespeare, with Reed as Chairman, was appointed to investigate the origin and spread of typhoid fever in the military camps. The report,[3] drafted largely by Victor C. Vaughan, consisting of two volumes, was published in 1904, and sent to the War Department of every country in the world. Further, Dr. Christopher Childs came from England, studied the material, and Vaughan acknowledged his valuable advice and assistance in preparing the report.[4] While all camps in which typhoid fever appeared were studied, the greatest amount of evidence was gained from the epidemic at Chickamauga.

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A NEW STUDY OF ALCOHOLISM

ALCOHOL and alcoholism are again attracting expert study. After a period of relative quiescence the subject has again been brought to the fore. In spite of the scientific, sociological, and other studies that have been made of alcohol over many years, it seems that there are still many questions about which we know little and other phases of the problem which are highly controversial. In 1932, to mention only one, a volume [1] appeared, written by 23 authors, which presented the known facts about alcohol in its biological and human relationships, since the texts in physiology, hygiene, and the health, and the courses based on them in schools were unsound and not in accord with the best interests of the pupils or the community. It was hoped that this knowledge would help to clear up the "muddled thinking, emotional floundering, and political propaganda" so as to determine a national policy dealing with the liquor question.

We now have the announcement of the Research Council on Problems of Alcohol which proposes to go over much of the same ground again. This Council includes scientific men, physicians, business men, educators, and public health officials. It claims to have no bias in respect to the use of alcohol, and its only object is to obtain the truth about alcohol and give it to the public whatever that truth may be. The Scientific Committee is made up of 34 men, while the Executive Committee has 16, in addition to which there is an Advisory Committee of 5. Some members of the Scientific Committee wrote for the book published in 1932, and altogether the personnel of the three committees gives assurance that the study will be thorough, covering every angle of a much discussed and vexed question which for ages has perplexed many of the nations of the world. "The

ultimate objectives of the Council are the cure and prevention of alcoholism and the alcoholic psychoses."

Attention has been called to the treatment of alcoholism as a public health problem and it has been classed with tuberculosis and syphilis as one of three of the major problems of public health today.[2]

Almost at the same time that this Council issued its preliminary announcement comes the statement from Allied Youth, Inc.,[3] calling attention to the fact that young people today find themselves in a difficult position as to drinking since the use of alcoholic beverages is increasing and it is held by many to be "the thing to do." It is claimed that inquiries so far indicate that nearly one-half of the members of senior classes in high schools and more than one-half of all young people are drinking, while in the larger universities and colleges the majority of students are using liquor. Allied Youth, Inc., is interested in education concerning alcohol in high schools, colleges, and communities.

There can be no question of the importance of these movements. We wish for both the success which their motives deserve. We need all the information possible on every aspect of alcohol and its use, and the facts should be widely taught without emotionalism or bias.

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TRANSFER OF THE PUBLIC HEALTH SERVICE

A SHORT time ago we called attention to the transfer of the Public Health Service to the Federal Security Agency. On April 11, 1940, the President sent to Congress Reorganization Plan No. IV which transferred to the Federal Security Agency from the Interior Department, St. Elizabeths Hospital, Freedmen's Hospital, Howard University, and Columbia Institution for the Deaf.

More important perhaps from the public health standpoint was the transfer to the same Agency of the Food and Drug Administration with the exception of two activities intimately related to the work of the Department of Agriculture, the Insecticide Act of 1910, and the Naval Stores Act. The Food and Drug Administration will function as a separate unit under the Federal Security Administrator and the chief of the administration will be known as the Commissioner of Food and Drugs.

These changes are in line with the plan which has been advocated by the American Medical Association for quite a time tending toward the establishment of an agency in the federal government under which all medical and health functions of the federal government except those of the Army and Navy will be coördinated and administered.

BOOKS AND REPORTS

International Health Division, The Rockefeller Foundation: Annual Report, 1938. *New York: Rockefeller Foundation,* 1939. 233 pp.

The activities of the International Health Division of the Rockefeller Foundation are published each year in a separate account for readers with a specialized interest in the field of public health. As has been the custom in former years, emphasis has been given to such laboratory and field work as might lead to the development of methods of dealing with public health problems which were at the same time better, more efficient, and more economical. Research studies carried out in close collaboration with field work are given considerable attention in this report. The field work was conducted in selected areas in various parts of the world where the Division has been asked to coöperate and where opportunities have been provided for promising work. During 1938 these areas included 12 states of the United States and 37 foreign countries.

The program falls into three groups: problems of the control of specific diseases, activities in relation to departments of health engaged in health demonstration work or the organization of permanent new lines of public health activity, and public health education through support given to selected schools and training centers. Concluding the report is in itemized table of expenditures for the year. Several photographs supplement the text and to each chapter is added an important bibliography.

Refinements of centrifuge technic were utilized in virus studies to reveal some of the physical properties of the virus particles, utilizing the animal titration and ultra-violet photography methods. The new advances in electrophoresis apparatus and methods developed in Sweden were studied and the technics found applicable to the investigation of virus and antiviral substances. Studies of specific diseases included yellow fever, influenza, tuberculosis, syphilis, rabies, worm diseases, Rocky Mountain spotted fever, sylvatic plague, scarlet fever, and malaria. The eradication of yellow fever from the Americas by collaborating in the organization of antimosquito campaigns in leading urban and rural areas of endemic infection was fairly successful, but it was realized that jungle fever flourishing in several South American areas presented a more difficult problem. Today this is met by three types of activity. Postmortem viscerotomy for diagnosis on all patients dying less than 11 days after the onset of any febrile illness, and antimosquito measures have assisted in the clearing of urban areas. But jungle fever control necessitated the widespread use of individual immunization of exposed populations and 1,059,252 persons were so vaccinated in Brazil during 1938 with satisfactory results. The properties of this virus vaccine were closely investigated to rule out the possibility that the strain might revert to the pathogenic form by further mosquito-human transfers. It is pointed out that the monkey and not man is responsible for maintaining the virus, and vaccination will not bring an end to the disease entity. Several other mosquito vectors of the disease have been discovered, and it is apparent that important unsolved problems exist in our understanding of yellow fever since

it occurs under a wide variety of natural conditions and is thereby subject to many variations.

Intensive and continued observations of the members of over 500 tuberculous families begun in 1933 were completed in 1938. Steps looking to the further development of the Kips-Bay-Yorkville health center with the aims of the establishment of a model tuberculosis clinic, the instruction of physicians, nurses, and medical students, and the conduct of epidemiological studies were initiated.

An epidemiological study in the Eastern Health District of Baltimore was undertaken in mid year to ascertain the humeral immunity to syphilis and continue further spirochetal studies. Protective substances against *Treponema pallidum* were found in the serum of persons long afflicted with the disease which is similar to that produced experimentally in rabbits. The question is raised as to the use of a possible serum protective substance rise as a means of differentiating the various strains of *Treponema pallidum*. The basic problem of accurate measurement of the prevalence of syphilis in a community in studying the epidemiology of the disease is stressed. The International Health Division helped the expansion of the syphilis control program with financial grants for postgraduate study.

Rabies, worm diseases, spotted fever, sylvatic plague are more briefly discussed. The fact that *Pasteurella pestis* could not be found in several thousand wild rodents and rodent fleas investigated in Western United States and Canada does not warrant a relaxation of vigilance it is pointed out, and repeated sampling is needed since periodic outbreaks have been known to occur.

Studies related to scarlet fever in 1938 have been directed chiefly toward the collection of data concerning diagnosis, treatment, and the work on antistreptolysin. Over 3,000 new strains of B hemolytic streptococci were isolated bringing the total to 7,562 strains. Increased prevalence in 1938 facilitated the threefold task of typing the streptococcal agent, and studying the preepidemic and epidemic community. The existence of atypical clinical cases during an epidemic is mentioned.

Public health administration was studied in several states and recommendations were made to state legislatures. Similar work was carried out in Mexico. The vital statistics branch of Manitoba, Canada, Health Department was aided in its morbidity and maternal mortality study to pave the way for a maternal hygiene program. Epidemiology, sanitary engineering hygiene and nutrition, and industrial hygiene constitute the branches aided. Local health department work was developed in many localities and valuable assistance rendered to provide additional staff, develop educational programs, establish and maintain health units, expand diagnostic, immunological and treatment work, and in general to help attain the goals of the local program. Surveys of medical care in foreign villages were made, and often the governments in question acted promptly on the Division's recommendations.

"Essential to the success of the Division's program is the presence of well chosen and trained personnel in each field, to help in organizing and to carry on when the Division aid is withdrawn." To encourage this public health education the Division provided numerous fellowships to properly qualified persons. Training centers have been planned in 5 districts to be operated in conjunction with 5 leading New York City medical schools. Grants were made to the World's Fair exhibits. Other institutes and schools of hygiene and public health aided included those at Stockholm, Johns Hopkins, field training units at Harvard and Tokyo, Sofia,

Ankara, Athens, Budapest, and Calcutta. Aid to education of public health nurses is reviewed since its commencement in 1920 and great advancement after the world war. In addition to grants to regular schools of nursing, aid has been given to the Henry Street Settlement and East Harlem Nursing and Health Service of New York City and to health centers in many parts of the world. Special grants were made to schools of nursing at Toronto, Canada, and Zagreb, Yugoslavia, and to a school of midwifery at Peiping, China. Many fellowships and travelling grants were also allocated. IRA V. HISCOCK

The Kosher Code of the Orthodox Jew. ***Being a literal translation of that portion of the sixteenth-century codification of the Babylonian Talmud which describes such deficiences as render animals unfit for food (Hilkot Terefot, Shulhan Aruk); to which is appended a discussion of Talmudic anatomy in the light of the science of its day and of the present time—By S. I. Levin and Edward A. Boyden. Minneapolis: The University of Minnesota Press,*** 1940. 243 pp. Price, $4.50.

While examining some 10,000 livers in the abattoirs around Boston, one of the authors, Dr. Boyden, learned from "kosher cutters" that such anomalies as he was looking for were described in the *Babylonian Talmud* (Venice, 1564), hence his interest in the present translation. The reviewer's interest in the subject was awakened by service on two boards of investigation of slaughterhouse practices in the United States, one just after the appearance of *The Jungle*, by Sinclair Lewis, and one during the administration of President Woodrow Wilson. Fairly extensive correspondence and interviews strengthened the interest but not until the appearance of this book has the matter been presented fully and clearly. Indeed, the Laws of Terefah * have been translated into a modern language—French—but once before (1898), by Pavly and Neviasky, and then only from the standpoint of comparative religion, yet they are full of interest from many standpoints, though for the purpose of this review, those concerning public health are preëminent.

There is a Preface by one author, Professor of Anatomy of the University of Minnesota, and an Introduction by the senior author, the Senior Orthodox Rabbi of Minneapolis. In these, two points of view are represented. Rabbi Levin hopes the translation will be of use not only to theological students but to those who are interested in the dietary laws and their origins in the culture of ancient Israel. The Preface shows interest chiefly from the standpoint of the anatomist, though public health is not forgotten. Upon the myriads of animals examined over some 2,000 years for conditions which might make them unfit for food, many anatomical observations have been made, and it is curious that anatomists in general have paid so little attention to this accumulation of valuable anatomical knowledge. In a review of such an unusual book one is tempted to quote at too great length.

Perhaps the greatest single contribution made by the Jewish inspectors concerns the gross anatomy of the surface of the lung. In the 3rd and 4th centuries these men were the first to record correctly the number of lobes and to anticipate their conception as outgrowths from a stem bronchus. The first description of the cauda equina was by the physician Samuel (3rd century) more than a thousand years before the classic work of Andreas Laurentius. They also noted adhesions, exudates, and nodules, some of which it seems impossible not to regard as lesions of tuberculosis.

* Terefah, torn by wild beasts; hence ritually unfit.

The digestive system was well described, and from the Jewish terms we have our present word "omasum." We owe to them the earliest accounts of the duplication of the intestines and the cloacal vents of birds. The *Talmud* also gives one of the earliest descriptions of young human embryos. There are many first accounts of duplication of organs and anomalies.

We are told why animals for food must be killed by bleeding (Lev. 1:5), and the reasons for rejecting carcasses under various circumstances are clearly explained. Of interest is the rejection of the hind quarters of animals, based on the story of Jacob, who wrestled with a man at Penuel. The man prevailed against him only by touching the hollow of his thigh, and Jacob ever afterward "halted upon his thigh." "Therefore the children of Israel eat not of the sinew which shrank, which is upon the hollow of the thigh, unto this day: because he touched the hollow of Jacob's thigh in the sinew that shrank" (Gen. 32:24–32).

From the practical standpoint the Jewish inspection is in some ways more thorough than that done by official inspectors in the slaughterhouses of the country. In every large city there are shops in which the parts rejected by the Jews can be bought, and one can be sure of a well inspected carcass when buying this meat.

The preparation of the animals for slaughter is painful and repulsive, and the reviewer has frequently seen several animals strung up by one leg for an unnecessarily long time undergoing physical torture as well as terror. This is more surprising since so much stress is put on avoiding cruelty to animals. The killing is done with a keen edged knife which usually severs both carotids and both jugulars as well as the trachea. The eyes glaze instantaneously. The slaughterer then feels the edge of his knife and if it is rough, the carcass is rejected, the reason being the alleged suffering of the animal. Where the animals have horns the head is held by a slaughterhouse attendant with the throat up. At present, since horned animals are not seen to a great extent, a box-like structure of galvanized iron is thrust over the muzzle of the animal so that the head can be twisted into place and held while the throat is cut.

The Table of Contents takes up the Laws of Terefah in sections, and the subheadings are so numerous and descriptive that in a few pages one gets the scope of the book. The Appendices give: (A) a Glossary of Hebrew Terms; (B) Rabbinical Authorities Cited; (C) Index of Scriptural and Talmudic Quotations; and (D) General References, in addition to which there is a good general index.

The book should have a place in every medical library and, according to Rabbi Levin, in the library of theological schools. The subheading of the title tells exactly what the book is. Of especial interest are the appended notes by Rabbi Levin which bring the code up to the practices of the present day, "so that it stands as an authentic guide to observers of the orthodox law."

In the review of the book, the advice of Professor Isadore Keyfitz, Professor of Semitic Languages, History and Institutions and Old Testament, University of Missouri, has been of much value, and is gratefully acknowledged.

MAZŸCK P. RAVENAL

Migration and Social Welfare: An approach to the problem of the non-settled person in the community—*By Philip E. Ryan. New York: Russell Sage Foundation*, 1940. 114 pp. Price, $.50.

The practical woodsman, when forest bewildered, climbs a high tree, from which, above the undergrowth, he may determine obscure home trails. This publication offers a similar panoramic

service to those who seek egress from the tangle of opinion and discussion of social, economic, and political phases of transiency and migration. Amidst much sophism, and even commercialized emotionalism, a calm and compact analysis of migration cycles, of their causes and consequences, and of the various proposals and experiments for alleviating their impacts, contributes a rational perspective of a national social phenomenon which has become particularly aggravating during the past decade.

The topical bibliography of twelve pages indicates the range of Mr. Ryan's investigation. It also illustrates the protean aspects of modern nomadism and should afford meditation for self-appointed oracles who proffer symptomatic rather than organic treatment.

JOHN J. SIPPY

Modern Diabetic Care—*By Herbert Pollack. New York: Harcourt, Brace,* 1940. 216 pp. Price, $2.00.

Modern Diabetic Care is in two parts, one from the strictly medical angle discussing the history, symptomatology, and the treatment of diabetes, the other devoted exclusively to nutrition and dietary preparations. The second part is written in collaboration with Marie V. Krause, Teaching Dietitian at the New York Hospital.

This book is well arranged and readable for the average diabetic. There are several chapters of an advisory nature such as—dealing with the young diabetic and his occupations; advice on pregnancy and general problems that might occur. The chapter on insulin is a very helpful one for the diabetic as it goes into the minutest details covering self injection. However, the information on the self regulation of the *insulin dosage* as given is confusing and should be left to the doctor alone.

The nutritional and dietary part and the tables in the appendix are routine necessities in all such books. The discussion on emergency diets, food budgets and recipes are to the point. The reader's attention is also drawn to the canned food problem.

The description on how to prevent the complications in diabetes is of interest to public health workers. It includes care of the skin, feet, teeth and mouth, as well as care in mental hygiene. Because of the simplicity in the presentation of this material and the many preventive and hygienic suggestions, this book is recommended for lay consumption and those public health workers who come in contact with diabetics.

MORRIS ANT

Manual of Water Quality and Treatment—*Prepared and published by The American Water Works Association,* 22 East 40 St., New York, N. Y., 1940. 294 pp. Price, $3.00.

This is a compendium of current North American water treatment practice prepared under the auspices of the Committee on Water Works Practice of the American Water Works Association. The following topics are discussed:

Characteristics of Available Sources, 6 pp.
Organisms in Water, 6 pp.
Standards of Quality, 34 pp.
Purification Occurring in Streams, Lakes, and Reservoirs, 23 pp.
Partial Treatment and Treatment Preliminary to Filtration, 42 pp.
Coagulants and Coagulation, 21 pp.
Chlorine and Other Chemicals, 28 pp.
Tastes and Odors, 8 pp.
Filtration, 35 pp.
Chemical Conditioning of Waters, 62 pp.
Treatment Plant Control, 8 pp.

The book is thoroughly up-to-date, well written, and has been carefully edited by well known experts in the field. The typographical set-up is excellent. A consolidated bibliography is given at the end. The volume is one which should be of value not only to the practising engineer but also to health officials and others interested in water supply and water purification.

LANGDON PEARSE

Virus and Rickettsial Diseases, With Especial Consideration of Their Public Health Significance: *Harvard School of Public Health Symposium Volume—By various authors. Cambridge: Harvard University Press,* 1940. 907 pp. Price, $6.50.

The volume at hand is the outgrowth of a summer symposium at Harvard University in 1939. Throughout the presentations sum up the knowledge of the day—perhaps we had better say "the knowledge as of June, 1939," since progress in these fields leads to rapid changes in our conception of many features of infectious diseases.

One turns to specific items and finds set forth many current views of interest; a few examples will illustrate. Gordon tells us that "our present knowledge of viruses would indicate that certain of them are living corpuscles, while others are crystalline" (p. 11) and considers the crystals "probably inanimate."

Gordon (p. 23) suggests the convalescent carrier state as being of more significance than is generally believed. He points out that in transmission by arthropods the vector may serve to propagate the virus or may act as a mechanical carrier (p. 24). Gordon considers latent infection to be identical with the preclinical phase (p. 47) or, as we usually say, with the incubation stage or that following recovery—the convalescent carrier state.

Mueller (p. 71) in considering certain essential properties of virus presents a chart (from Stanley, 1938) which visualizes the relative sizes of certain viruses, certain rickettsia bodies, and of certain bacteria and red blood cells.

Simmons gives a very full discussion of insect vectors of human diseases, and it is interesting to note that he considers insect transmission of poliomyelitis as definitely coming within the range of further study (p. 161).

General Russell leans to the view (p. 188) that the two types of smallpox with which we are familiar represent different strains, and mentions that Chapin (of Providence, Rhode Island) could not convince himself that there was any crossing over from one type to the other. Although the subject is "Epidemiology and Control of Variola" no mention is made of any effort at control beyond general vaccination—an omission that will be disappointing to a health officer serving a community that includes large numbers of anti-vaccinationists.

Robinson (p. 214) in discussing preparation and use of smallpox vaccine gives scant encouragement to those who would replace the time-honored fruit of the calf by a vaccine prepared by another method.

McKhann (p. 273) places, for practical purposes, the period of communicability of measles from the beginning of prodromes to the end of the fading of the rash. His well known views on prophylaxis by the use of Immune Globulin (placental extract) are fully developed.

Wesselhoeft, in a discussion of the encephalitides of mumps, distinguishes a specific one due to mumps virus and (p. 337) considers that this may activate a more serious secondary encephalomyelitic infection.

Nelson (p. 366) prefers the name *Lymphogranuloma inguinale* over the more recently proposed name *Lymphopathia venereum*. He appears to regard the Frei test more highly than some recent reports suggest. No reference is made to the great frequency of the disease in southern communities.

Mote (p. 423) considers epidemic influenza a "symptom complex, that is, an epidemiologic phenomenon and not a specific etiologic entity"—indisputable in the light of our present knowledge.

McKhann (p. 596) in discussing convalescent serum in the prophylaxis of

poliomyelitis answers, in the negative, the question of the value of the serum.

Aycock undertakes the problem of presenting and appraising preventive measures in poliomyelitis and, after reviewing the various measures which have been tried (p. 613), decides that none have been found of value.

Kelser (p. 649) in considering the problem of when to administer the prophylactic treatment against rabies, takes a wisely conservative attitude in the case of persons who have had contact with a rabid animal but have suffered no injury: He recognizes the doubtful value of general vaccination of dogs. Though the volume is not intended for the practitioner of medicine one would have appreciated a discussion of so-called "First Aid Treatment" where persons have been bitten by rabid animals.

Fothergill (p. 680) in considering prevention of naturally acquired equine encephalomyelitis in man regards protection from mosquitoes as the important factor.

The last part of the book deals with rickettsial diseases, defined by Wolbach (p. 789) as "self-limited specific infectious diseases transmitted by arthropods and characterized by continued fever and a rash."

Pinkerton dwells on the difficulties in diagnosis between members of the group (p. 822) even when histopathologic studies are possible and notes the occasional necessity for resort to animal inoculation and cross-immunity tests.

Gordon (p. 837) in considering the diagnosis of typhus, mentions the aid to be derived from cupping which brings the rash out in typical form.

Zinsser (p. 884) believes that either murine typhus, or classic European typhus, may be either endemic or epidemic. He regards Brill's disease as classical (p. 885) imported typhus endemic in cities with a large immigrant population.

In reviewing such a volume the reader naturally pays special attention to subjects with which he is personally familiar or in which he has a special interest, and that has been done in this instance.

For each subject discussed the book provides a liberal list of references. The volume will be indispensable to specialists in the fields covered and will be of value to all interested in infectious diseases. G. W. McCoy

Rural Health Work in Hungary—*By B. Johan. Publication No. 9 of the State Hygienic Institute of Hungary. Budapest: Royal Hungarian University Press,* 1939. 230 pp.

In this volume Dr. B. Johan, Undersecretary of State, describes the activities of the Hungarian State Institute of Hygiene, the establishment of which was promoted by the Rockefeller Foundation. The book covers the organization, methods of work and achievements of the Institute's program for rural health work, with special emphasis on preventive health services. It includes material on vital statistics, personnel, administration, and all of the Institute's basic activities in the field of public health.

The nature of the material varies from such a statement as "The nurse should never forget that in a small place everything is always known about everybody" to such a thought-provoking statement as the indication that a person's nutrition is classified as "satisfactory," "if there is in the weekly menu 4 times milk, once meat, and once vegetables or fruits." Because of this unevenness and because of somewhat unconventional English usage, the book requires more than a casual perusal for the sifting of significant facts. The public health worker will find an interesting contrast between the rural health problems presented and those with which he is more familiar. C. E. TURNER

Cases of Syphilis Under Treatment, Cuyahoga County, March, 1939—*By Howard Whipple Green, Joint Social Hygiene Committee of the Academy of Medicine and the Cleveland Health Council. Cleveland, Ohio,* 1940. 49 pp.

In coöperation with 1,556 physicians and 21 institutions in metropolitan Cleveland, the Joint Social Hygiene Committee presents an analysis of data relating to patients treated for syphilis during March, 1939. In this, their third report, the committee again answers questions of paramount interest as to the extent of syphilis under treatment, whether the treated case is infectious or non-infectious, whether it is a new or an old case, and whether treatment is administered by the physician or in the institution. Although recently the emphasis formerly directed toward complete treatment of all cases of the disease has been shifted toward the goal of reaching the contacts, it is emphasized that active infectious cases already under treatment must not be allowed to disappear without first being rendered non-infectious.

The factual data were, as in the former studies, determined by questionnaires mailed to 1,562 physicians and 78 hospitals and institutions in Cuyahoga County. The fact that replies were received from all but 6 of the physicians and from all of the institutions and hospitals makes this report of especial value. A total of 4,319 cases were found to be under treatment, 1,409 under the care of private physicians and 2,910 in institutions. The report is composed of numerous tables and diagrams supplemented by discussion.

Data are presented regarding the incidence of syphilis with reference to sex, age, and race differences, and changes from the March, 1938, study are noted. While the rate for whites decreased, that for Negroes rose, the present rates for the latter being 10 times the white rates. The sex ratio was 50:50 and the 5 year age group with the greatest number of cases was the 35–39 year group. About one-third of all cases are treated by the private physician, 87 per cent of whose cases are white despite the fact that the number of cases in each racial group is approximately the same. The extent of the physician's treatment of syphilis is indicated by the fact that about 27 per cent of those questioned had treated cases during March, 1939, one-half of these having only one or two cases under supervision. Of the infectious cases, 35 per cent were treated by only 12 physicians.

Since syphilis is communicable only in its infectious stage and since prompt treatment will render the disease non-infectious, the success of its control lies in promptly treating the new infectious case and continuing treatment until such time as the case becomes non-infectious.

Only 6 per cent of the 1,409 cases treated by the physicians were new and infectious, only 5 of the physicians treating more than one or two new and infectious cases during the month. The fact that as many as 145 cases of infectious syphilis under treatment are estimated from the data to have failed to report for therapy during March is a matter of real concern to everyone interested in reducing the incidence of syphilis to any appreciable extent, Mr. Green declares. That this condition is improving is apparent since 66 per cent fewer cases treated during the two previous months failed to report during March, 1939, than during the previous test period one year before.

Although facilities for the treatment of the disease in several hospital outpatient departments are still being severely overtaxed by the enormous number of cases under care, the number of infectious cases treated is " surprisingly small." Therefore, the bulk of the load on most institutions is caused by con-

tinued treatment of old cases, most of which are non-infectious. Moreover, since 85 infectious cases treated during the previous 2 months failed to return for treatment in the test month, the author declares "it is vastly more important to those interested in the control of syphilis that these 85 cases be rendered non-infectious by adequate treatment than that treatment be administered to the 2,350 non-infectious cases cared for that month."

GEORGE JAMES

Annotated Bibliography on Incineration, Carbonization and Reduction of Garbage, Rubbish and Sewage Sludge—*Collected and prepared by Project 465-97-3-35—Research in Selected Problems in Sewage Treatment—U. S. Works Progress Administration for the City of New York. Sponsored by Department of Sanitation for New York City. New York: New York University,* 1939. 146 pp.

This is the latest contribution of the WPA's Research in Selected Problems in Sewage Treatment Project for which the late Professor Lewis V. Carpenter was Director.

Beginning with the earliest reference of municipal refuse disposal by burning in 1900 B.C., the items are chronologically arranged up to and including those issued during 1938. Over half of the entries were published since 1930.

The objectives of the bibliography (to cover the history and description of various methods of incineration, to provide data on other municipal refuse disposal processes for comparison with incineration and to compile the entries and indices so that further study is facilitated on selected subjects) appear to have been accomplished.

F. J. MAIER

Teaching Wholesome Living—*By Alma A. Dobbs, M.A. New York: Barnes,* 1939. 304 pp. Price, $2.50.

This interesting book places emphasis upon positive health and the interrelationships of the different aspects of wholesome living. It would be useful as a basis of discussion in teacher groups, in parents' meetings, and by others concerned with school health education. It goes without saying that there will not be complete agreement as to the teachings set forth, but the book stimulates thinking and combines to a remarkable degree fine educational philosophy with practical suggestions for everyday experiences. Its usefulness would have been increased by more careful editing.

One of the strong features is the emphasis on the ability to make wise choices as illustrated by the following quotation:

> The child is unique: he differs from all other life in that in him alone are possibilities for becoming aware of himself and of his power to direct somewhat his behaviors and in a degree to modify the circumstances of his life. His impetus is to seek that by which to grow, but to live successfully he must grow in consciousness of the part he plays in determining his life by the exercise of his power of choice. We do not know the stages in the development of this unique capacity, this consciousness of the self as the center of activity. It is potential at birth and has its rise in the very young child's experience.

The author handles particularly well the evils of the conflict between instruction and any opportunity for practice and also points out the evils of standardized programs without due recognition of the wide differences in individuals. The danger of attempting to force children to grow beyond their normal rate is vividly portrayed: "we cannot push growth, for by trying, as in forcing open a rose bud, we destroy that which we prize."

The original approach used in the book is illustrated by the sections on laughing and crying which are dealt with very directly as two human experiences not often included in health texts. The emphasis is in the right place on

the unity of personality, and we are in complete accord with the attention given to the creation of a happy, joyous atmosphere for the normal, natural growth of students.

The author is a teacher who uses her wide experience to organize the book in a way to make it valuable to those responsible for curriculum making. In part one, fundamental principles of child growth are explained; part two is concerned with the broader aspects of curriculum construction; part three deals with specific phases of the curriculum including a variety of pupil activities and life situations. There are also a supplement and an index covering topics of concern to all teachers and parents. The book is recommended as worthy of careful study and frequent reference.

PAULINE BROOKS WILLIAMSON

Penny Marsh, Supervisor of Public Health Nurses—*By Dorothy Deming, R.N. New York: Dodd, Mead,* 1939. 303 pp. Price, $2.00.

In this sequel to *Penny Marsh, Public Health Nurse* we follow Penny to a large city where she gains further professional experience and training as a supervisor of public health nurses. Her experiences and adventures are numerous—she undoubtedly experiences every possible emergency a nurse in such an organization meets, including an epidemic of influenza. Record keeping, supervising, personal relationships, all are cleverly brought in, so that a girl who has been interested in the public health nursing profession may gain some impression of how much lies before her.

All is not hard work, for Penny lives a fairy princess existence after hours with a bachelor uncle of means, and has her full share of beaux and lovers' quarrels. As the previous book ends with an engagement, we finally have Penny married, but some may wonder whether after only two years as a public health nurse the training is worth while.

Written entertainingly, with the heroine a charming, successful girl, the educational material should prove most interesting to 'teen age girls who are in search of advice on choosing a profession. MARGARET MCC. HISCOCK

The Medical Career and Other Papers—*By Harvey Cushing. Boston: Little, Brown,* 1940. 302 pp. Price, $2.50.

This is a collection of addresses given on various occasions and biographical sketches, all of which have been published elsewhere. The title is that of an address given at Dartmouth College in 1928. The biographical sketches, with one exception, are of men well known by the author. Haller and His Native Town was the author's "first literary venture," written in Berne and published in 1901.

The essays are largely historical but contain a good deal of philosophy, and all of them have some history. The biographical sketches are delightful, especially when the reader has known the subject. Close association, with a naturally observing eye, has fitted the author for the task he has done so well.

Among the addresses, perhaps the outstanding one is "From Tallow Dip to Television," given at the 150th reunion of the Massachusetts Medical Society in 1931. Its one blemish is the fallacy put into the mouth of Dr. Holyoke, the first President of the Society (1781), of attributing to Theobald Smith the elucidation of the connection between strumous diatheses of children and tuberculosis, and showing that they were due to infection from the milk of tuberculous cows. The demonstration of the transmissibility of bovine tuberculosis to human beings was made at the University of Pennsylvania in the Laboratories of the State Live Stock Sanitary Board in 1902. Smith persisted in defending the mistaken idea

of Koch, and it was not until 1905 that he first isolated the bovine bacillus from human tissues.

Altogether, the book is very readable and is a notable addition to the medical history of our times.

MAZYCK P. RAVENEL

Elements of Statistical Reasoning —*By Alan E. Treloar, Ph.D. New York: Wiley,* 1939. 261 pp. Price, $3.25.

The author attempts to describe and discuss the concepts of statistics by the use of English composition for the most part and without recourse to the mathematical analysis necessary as a background of proof—despite his statement (p. 3) that only in a relatively loose sense may subjectively interpretable words serve as a vehicle of scientific description. Considering the essential limitations of the procedure, he does a good job over a wide range of concepts including such modern items as the t-test, confidence intervals, and z-test for correlation, and Chi-square. One instance of the difficulties due to the limitations is in the treatment of kurtosis (pp. 33, 73) where he speaks of kurtosis as degree of peakedness, degree of curvature at the peak, etc., in a manner that is hardly justifiable scientifically in view of the fact that the isosceles triangle has a smaller kurtosis but a higher and sharper peak than the normal curve of equal standard deviation, and despite the further fact that the measure of kurtosis is derived from the totality of the frequency distribution, whereas his English suggests restriction to the neighborhood of the peak.

The book deals with general statistics rather than specifically with the problems of vital statistics. There are a discussion of adjusted death rates and a comparison of Maine with Montana for 1930, a brief discussion of life tables, and some treatment of sampling variations of rates.

There are a number of unfortunate typographical errors and a number of inaccuracies of statement; for example, when (p. 121) he states that the fluctuations may be justly ascribable to sampling errors although if the reader should routinely compute Chi-square he would find P=.02. In general it must be noted that the spirit of the English school (Pearson, Fisher) is followed rather than that of the continental (Bortkiewicz, Wicksell), with a consequent emphasis on pure chance and a neglect of considerations concerning chance as a cover for all our ignorance including our ignorance of whether the laws of pure chance are applicable to the problem in hand. Incidentally Yule is not cited.

E. B. WILSON

School Health Problems — *By Laurence B. Chenoweth, M.D., and Theodore K. Selkirk, M.D., with a chapter on School Health Administration by Richard A. Bolt, M.D., Dr.P.H. (2nd ed.) New York: Crofts,* 1940. 419 pp. Price, $3.00.

This scientific discussion of health problems in school, in its second edition, has been brought up to date for the use of college classes, for school physicians, nurses, and teachers. A new chapter on Sanitation of the School deals with the school site, heating, lighting, sanitation of pools, and building arrangements. In a second new chapter, important aspects of the Teaching of Health are considered. Useful material is also contained in the appendices, together with valuable reading lists and a glossary. This text has been carefully prepared and should prove equally valuable to teachers and to those engaged in public health work.

IRA V. HISCOCK

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Health for Children in School—To create a healthful environment, provide for care of accidents and sudden illnesses, prevent and control communicable disease, set up a graded program of health instruction, encourage health examinations, give special attention to those in need of medical or dental care, and make possible special programs for the handicapped—these are the essentials of the school health program proposed by an important committee. Should be read by all.

ANON. Suggested School Health Policies. J. Health & Phys. Ed. 11, 5:283 (May), 1940. (also) J.A.M.A. (Organization Section) 114, 17:1673 (Apr. 27), 1940.

Where Cancer Strikes—Even with changing age composition taken into account, cancer incidence shows a continuing increase. Cancer of the digestive tract caused about half the deaths. Cancers of all except the buccal cavity and skin (in males) had higher death rates. Other gruesome but important findings are recorded.

ANON. Cancer Mortality in the United States According to Site, by Sex and Age. Pub. Health Rep. 55, 17:711 (Apr. 26), 1940.

Educating Educators about TB—Of all the great number of American colleges, 165 are now attempting to find tuberculosis among their students. The story of the variety of efforts being made to induce the others to do something makes this an interesting and valuable document.

ANON. Ninth Annual Report of the Tuberculosis Committee, American Student Health Association Journal-Lancet (Minneapolis) 60, 4:178 (Apr.), 1940.

Lay Misinformation about Cancer—Is cancer curable? Is it contagious? What causes cancer? Do you know any symptoms? Is it shameful? Which disease is the most serious health menace? These questions asked recently, and a year ago, indicate that educational progress is being made but the need for greater effort is emphasized by public misinformation. Many still believe that aluminum cooking utensils cause cancer.

ANON. The Need for Intensive Educational Campaigns in Cancer Control. Pub. Health Rep. 55, 15, 653 (Apr. 12), 1940.

About Rabbit Fever—Here you will find an excellent statement about tularemia all ready for you to use in your news item, handbill, bulletin, radio talk, or whatever publicity medium you may want to employ next fall.

ANON. Tularemia. Pub. Health Rep. 55, 16:667 (Apr. 19), 1940.

Advice to Mothers—Here is applied common sense in the care and feeding of young school children. A fine example of parent education.

BAUER, W. W. Health and Happiness. National Parent-Teacher, 34, 9:29 (May), 1940.

What to Eat and Why—You will discover an excellent summary of our present-day knowledge of the important vitamins of human significance in this article written for nurses. Appended is a table showing probable requirements, functions, effects of deficiency and chief sources of each.

BECKER, J. E. The Vitamins. Am. J. Nurs. 40, 5:507 (May), 1940.

Many Children Still Die of Diphtheria—In 1938 more than 30,000 cases and 2,600 deaths from diphtheria were recorded in this progressive land of ours. Maps showing county rates tell dramatically where the children are allowed to sicken and die.

DAUER, C. C. Geographical Distribution of Diphtheria Mortality in the United States. Pub. Health Rep. 55, 15:622 (Apr. 12), 1940.

Malignant Growths and Cancer Deaths—Some revealing diagrams of cancer incidence and deaths by sites, by age grouping, color, etc., illustrate this analytical study from Chicago.

DORN, H. F. The Incidence of Cancer in Cook County, Illinois, 1937. Pub. Health Rep. 55, 15:628 (Apr. 12), 1940.

A Close Watch on TB—When a group of people, originally non-tuberculous, were studied over a period of years it was found that tuberculosis developed about as frequently in those with negative chests as in those showing a healed primary infection. Many cases may go long unrecognized unless a fluoroscopic examination is made.

FELLOWS, H. H. Serial Chest Roentgenograms of 3,179 Office Employees, 1926–1938. J. Indust. Hyg. & Toxicol. 22, 5:157 (May), 1940.

Modern Treatment of Pneumonia—Almost all of us must be interested in the present status of pneumonia treatment even if only casually. Here you will find an excellent discussion of the place of sulfapyridine and immune serum in the different stages and kinds of pneumonia cases.

FINLAND, M., *et al.* Clinical and Laboratory Studies on the Use of Serum and Sulfapyridine in the Treatment of Pneumococcal Pneumonias. New Eng. J. Med. 222, 18:739 (May 2), 1940.

Kindness to Eyes Department—All "daylight" lamps or filters do not produce good synthetic light. The optimum intensity of light differs with the individual and the particular kind of ocular defects he enjoys. In reading 10 pt. type most people prefer less than 15 foot candles of light. Age and nearsightedness have a lot to do with light requirements. There is a great deal more about lamps, paper, etc. You will learn here that flat black ink on white mat paper is best.

FERREE, C. E., and RAND, G. Optimum Working Conditions for the Eye. Sight-Saving Rev. 10, 1:3 (Mar.), 1940.

Herpes, Rabies, *et al.*—Last minute report upon the most recent research in immunity to the viral diseases. Should not be missed.

GOODPASTURE, E. W. Immunity to Virus Diseases. New Eng. J. Med. 222, 22:901 (May 30), 1940.

Our Trachomatous Population—Where do you think trachoma is most prevalent? Probably you will be surprised by the spot map of reported cases accompanying this discussion of the disease among Indian and non-Indian people in the U. S. A.

GRADLE, H. S. Incidence and Distribution of Trachoma in the United States. Sight-Saving Rev. 10, 1:13 (Mar.), 1940.

Prophylaxis of Foot Defects—Preventing adult foot disorders is best done by correcting the posture habits of the child. This paper ably discusses the child's foot and the shoeing and care thereof.

HAUSER, E. D. M. Care of Feet in Children. Pub. Health Nurs. 32, 5:285 (May), 1940.

Promptness of Isolation—It is assumed that the prompt isolation of communicable disease cases helps in control of epidemics. This implies a minimum of delay in calling the physician after the first signs appear, in transmitting the report to the health department and in the public health nurse's first visit. What actually hap-

pens in one well regulated community is revealing.

LANE, E. A. Administrative Factors Involving Effectiveness of Communicable Disease Control. Pub. Health Rep. 55, 17:711 (Apr. 26), 1940.

Experiments upon Cold-Virus Vaccine—Evidence obtained from a small group of adults indicates that a tissue-culture cold-virus vaccine is effective in preventing natural colds. Given hypodermically the virus is safe but intranasal use seems to cause colds.

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Protecting Children from Whooping Cough—Favorable results from immunization with pertussis vaccine are reported from San Francisco. Of 64 immunized children who were exposed, 5 contracted the disease, whereas all but one of the exposed controls came down with whooping cough. How long the immunity lasts is not established.

SINGER-BROOKS, D. Pertussis Prophylaxis. J.A.M.A. 114, 18:1734 (May 4), 1940.

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ASSOCIATION NEWS

SIXTY-NINTH ANNUAL MEETING

DETROIT, MICH., OCTOBER 8–11, 1940

HEADQUARTERS

Book-Cadillac Hotel and Hotel Statler

RAILROAD FARES FROM VARIOUS POINTS TO DETROIT, MICH.

AMERICAN PUBLIC HEALTH ASSOCIATION

OCTOBER 8–11, 1940

From	*One-way Pullman Travel*	*Round trip Pullman Travel*	*One-way Lower*	*One-way Upper*
Atlanta, Ga.	$22.24	$36.40	$5.80	$4.40
Baltimore, Md.	18.00	33.70	4.50	3.10
Boston, Mass.	23.30	42.75	5.25	3.60
Buffalo, N. Y.	8.40	15.10	2.10	1.45
Chicago, Ill.	8.55	16.65	2.65	1.80
Cleveland, Ohio	4.90	9.65	2.65	1.80
Dallas, Tex.	34.92	56.35	8.95	6.80
Denver, Colo.	39.61	63.25	9.45	7.20
Duluth, Minn.	21.85	37.20	5.25	4.00
Fort Worth, Tex.	34.92	56.35	8.95	6.80
Indianapolis, Ind.	8.05	15.70	2.65	1.80
Jacksonville, Fla.	32.42	51.80	8.40	6.40
Kansas City, Mo.	22.33	37.35	5.25	4.00
Louisville, Ky.	11.20	20.80	3.15	2.20
Los Angeles, Calif.	74.71	106.95	18.90	14.40
Memphis, Tenn.	22.40	37.30	5.80	4.40
Milwaukee, Wis.	11.10	20.50	3.20 *	2.35 *
Minneapolis, Minn.	20.39	35.00	4.50	3.40
Nashville, Tenn.	17.01	28.60	5.30	3.80
New Orleans, La.	32.90	52.85	8.40	6.40
New York, N. Y.	21.50	39.75	4.50	3.10
Omaha, Nebr.	23.11	39.10	5.80	4.40
Philadelphia, Pa.	19.40	36.25	4.50	3.10
Pittsburgh, Pa.	8.85	17.25	2.65	1.80
Portland, Ore.	72.89	106.95	18.40	14.00
Salt Lake City, Utah	53.34	76.45	13.40	10.20
San Francisco, Calif.	74.71	106.95	18.90	14.40
Seattle, Wash.	72.89	106.95	18.40	14.00
St. Louis, Mo.	14.90	26.30	3.15	2.20
Washington, D. C.	18.00	33.70	4.50	3.10
Montreal, Que.	19.25	34.65	4.20	2.90
Halifax, N. S.	40.60	69.25	8.95	6.70
Ottawa, Ont.	16.25	29.25	4.10	3.05
Quebec, P. Q.	24.90	44.80	6.20	4.50
Toronto, Ont.	7.75	13.95	2.10	1.45
Vancouver, B. C.	72.89	106.95	19.20	14.60

* Seat to Chicago

Detroit Art Center

DETROIT HOTELS

Hotel	Room Capacity	Single Room: Without Bath	Single Room: With Bath	Double Room: Without Bath	Double Room: With Bath
Abington	336		$3.00 up		$4.00–$5.00
Barlum	800		2.00 "		3.00– 4.00
Belcrest	400		3.00 "		4.00– 5.00
Book-Cadillac	1,200		3.00 "		5.00– 6.00
Briggs	200		2.00 "		3.00– 4.00
Detroit Leland	800		2.50 "		4.00– 5.00
Fairbairn	400	$1.25	2.50 "	$2.50	3.00– 3.50
Fort Shelby	900		2.50 "		4.00– 5.00
Imperial	200		2.00 "		2.50– 3.50
Lee Plaza	475		3.00 "		5.00– 6.00
Norton	250	1.25	2.00 "	$2.50–$2.75	3.00– 4.00
Palmetto	324		2.50 "		4.00– 5.00
Prince Edward, Windsor	250		2.50 "		4.00– 5.00
Savarine	500	1.50	2.25 "	$2.50	3.25– 5.00
Statler	1,000		3.00 "		5.00– 5.50
Tuller	800		2.00 "		3.50– 4.50
Wardell	650		3.00 "		4.50– 5.50
Webster Hall	800	1.50	2.00 "	2.50	3.50– 4.00
Whittier	850		3.00 "		4.50– 5.00
Wolverine	500		1.50 "		2.50– 4.00

.....(Cut off on this line and mail to the hotel of your choice).....

HOTEL RESERVATION BLANK FOR THE DETROIT MEETING AMERICAN PUBLIC HEALTH ASSOCIATION, OCTOBER 8–11, 1940

To .....
(Name of Hotel)

Please reserve for me ..... rooms for ..... persons for the A.P.H.A. Meeting.

Single room ..... Double room .....

Maximum rate per day for room $..... Minimum rate per day for room $.....

I expect to arrive ..... If date of arrival is changed I will notify you at least 24 hours in advance.

Please acknowledge this reservation.

Name .....

Street address .....

City ..... State .....

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

James R. Amos, M.D., Dist. Health Office, Higginsville, Mo., Dist. Health Officer

Martin Bernfield, M.D., Tombstone, Ariz., City Health Officer

John F. Busch, M.D., N. E. Peachtree St., Atlanta, Ga., Clinician, Div. of Tuberculosis Control, State Dept. of Public Health

George F. Campana, M.D., M.P.H., 114 Terrace Place, Brooklyn, N. Y., Medical Officer in Charge, Williamsburg-Greenpoint Health Dist.

Abe J. Davis, M.D., Swainsboro, Ga., Regional Medical Director, State Health Dept.

Lt. Col. Charles F. Davis, M.C., U. S. Army, Holabird Quartermaster Depot, Baltimore, Md., Post Surgeon

Herbert Duncan, M.D., Lewisburg, W. Va., Director, Greenbrier Health Dist.

H. Manning Elliott, M.D., 116 W. Temple St., Los Angeles, Calif., Director, Venereal Disease Clinic

J. Rufus Evans, M.D., 120 Clairmont Ave., Decatur, Ga., Commissioner of Health, Dekalb County Board of Health

Robert B. Griffin, M.D., 504 Church St., Marietta, Ga., Medical Director, Northwest Region, State Dept. of Health

James F. Hackney, M.D., M.P.H., 804 City Hall, Atlanta, Ga., Asst. Health Officer

W. B. Harrison, M.D., Gainesville, Ga., Health Commissioner, Hall County Health Dept.

Frank D. Laffoon, 312 Broadway, Jefferson City, Mo., State Supervisor, Public Health Projects, W.P.A.

Sigma V. Lewis, M.D., E. Main St., Plymouth, N. C., Dist. Health Officer, Currituck-Dare-Hyde-Tyrrell-Washington Dist. Health Dept.

Wilbur D. Lundquist, M.D., Burke County Health Dept., Waynesboro, Ga., Commissioner of Health

Burruss B. McGuire, M.D., Health Dept., Kenansville, N. C., Health Officer, Duplin County

Frank Onufrock, 332 S. Eyon St., Colorado Springs, Colo., Member, Colorado State Board of Health

Charles A. O'Quinn, M.D., County Health Dept., Perry, Fla., Director

Earle M. Rice, M.D., D.T.M., 137 Stocker Drive, Windemiere, Charleston, S. C., Director, Health & Sanitation Div., State Public Service Authority

Carolyn Silbermann, M.D., 428 E. 140th St., New York, N. Y., Health Officer-in-Training, East Harlem Health Dist.

James H. White, M.D., Lowndes County Health Dept., Corinth, Miss., Health Officer

Laboratory Section

Laura F. Bates, A.B., 805 Grant St., Madison, Wis., State Laboratory of Hygiene

Phillip J. Brady, P. O. Box 343, Pullman, Wash., Student, Dept. of Bacteriology, Washington State College

Doris F. Olson, B.S., 1304 York St., Denver, Colo., Laboratory Technician, Presbyterian Hospital

Lester V. Smith, B.A., Chattanooga Branch Lab., Chattanooga, Tenn., Director

Robert D. Speer, 802 City Hall, Atlanta, Ga., Chemist-Bacteriologist, City Health Dept.

Vital Statistics Section

Frances R. Griffith, B.S., 2678 Jasmine St., Denver, Colo., Supervisor, Statistical Tabulating Unit, State Div. of Public Health

Eugene L. Hamilton, 103 City Hall Annex, Dallas, Tex., Registrar of Vital Statistics, Public Health Dept.

Engineering Section

Joel C. Beall, B.S. in C.E., 6 Hardeman Bldg., Macon, Ga., Assistant Engineer, State Dept. of Public Health

Harry C. Essick, 814 N. Monroe St., Albany, Ga., Sanitary Inspector, U. S Public Health Service

George H. Heryford, County Health Dept., Medford, Ore., Sanitarian, Jackson County Health Dept.

Loyal W. Murphy, Jr., B.S., 6 Hardeman Bldg., Macon, Ga., Assistant Engineer, State Dept. of Public Health

Earl A. Neuru, B.S., Health Dept., Thurston County Court House, Olympia, Wash., Acting Sanitarian

Industrial Hygiene Section

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Food and Nutrition Section

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bury, Mass., Graduate Student, Massachusetts Institute of Technology

Martha J. Singleton, A.B., 4800 Jefferson St., Kansas City, Mo., District Supervisor of Housekeeping Aid, W.P.A.

Maternal and Child Health Section

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Georgia V. Mills, M.D., 854 Algonquin Ave., Detroit, Mich., Field Physician in Maternal and Child Hygiene, State Dept. of Health

John W. Ross, D.D.S., 1520 Spruce St., Philadelphia, Pa., Private Practitioner

James E. Russell, Jr., M.D., 820 Metropolitan Bldg., Denver, Colo., School Physician

Public Health Education Section

Earnest Ballow, 1321 Freeman St., Santa Ana, Calif., Sanitarian, Orange County Health Dept.

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Jorma L. Kaukonen, B.A., U. S. Public Health Service, Washington, D. C., Asst. Health Education Specialist

Kathryn I. Maxwell, R.N., 15726 Rutherford Ave., Detroit, Mich., Public Health Nurse and Field Supervisor, Dept. of Health

William J. McMenamy, D.D.S., 2652 Fairfax St., Denver, Colo., Supervisor, Dental Dept., Denver Public Schools

Verne L. G. Wilt, D.D.S., 806 Chamber of Commerce Bldg., Los Angeles, Calif., Chief Dentist, Health Service Section, Los Angeles City School District

Public Health Nursing Section

Alice F. Brackett, R.N., M.A., 911 Humboldt Bank Bldg., San Francisco, Calif., Public Health Nursing Consultant, U. S. Children's Bureau

Lucille M. Brown, R.N., Anchorage Health Dept., Anchorage, Alaska, Staff Nurse

Winifred R. Clarke, R.N., M.A., 71 Parkview Place, Baldwin, N. Y., Instructor in Health Education, Hofstra College

Vera A. Mingledorff, B.S., P. O. Box 335, Griffin, Ga., Consultant Nurse, West Central Region, State Dept. of Public Health

A. Margrete Smock, R.N., Belle Glade, Fla., Camp Nurse, Farm Security Admin., U. S. Dept. of Agriculture

Alma T. Spencer, R.N., Territorial Dept. of Health, Kodiak, Alaska, Public Health Nurse

Ida J. Sprenger, Territorial Dept. of Health, Nome, Alaska, Public Health Nurse

M. Idella Sundquist, R.N., 843 S. University Blvd., Denver, Colo., School Nurse, Denver Public Schools

Mary K. West, 1515 80th Ave., Oakland, Calif., Public Health Nurse, Alameda County Health Dept.

Dorothy K. Whitney, R.N., B.S. in N., Territorial Dept. of Health, Palmer, Alaska, Public Health Nurse

Martha E. Wright, Trenton, Ga., County Health Nurse

Epidemiology Section

Oma H. Price, M.D., 2332 7th Ave., New York, N. Y., Medical Consultant, Bureau of Social Hygiene, City Health Dept.

Frederick Sargent, 96 Sutherland Road, Brookline, Mass., Student, Massachusetts Institute of Technology

John M. Walton, M.D., City Hall, Atlanta, Ga., Venereal Disease Control Officer, City Health Dept.

Unaffiliated

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William E. Brown, M.D., College of Medicine, Eden & Bethesda Aves., Cincinnati, Ohio, Associate Professor of Preventive Medicine, Univ. of Cincinnati

William A. Horan, M.D., 319 Broad St., Providence, R. I., Chief, Crippled Children's Bureau, State Dept. of Public Health

Bernard McDevitt, Jr., A.B., 111 W. Washington St., Chicago, Ill., Instructor of Public Health Law, Loyola Univ.

Levitte Mendel, A.B., 138 Byron St., Palo Alto, Calif., Student, Univ. of Michigan

John A. O'Connell, M.D.V., 31 Milk St., Rm. 616, Boston, Mass., City Veterinarian

Carl B. Pitman, D.D.S., 914 Doctors Bldg., Atlanta, Ga., Director of Dental Health, Fulton County School System

Takemune Soda, M.D., M.P.H., Taihoku Imperial Univ., Taihoku, Japan, Professor, Institute for Tropical Medicine and Medical Officer, Formosa

Buell H. Van Leuven, M.D., 213 Clinton St., Petoskey, Mich., Public Health Trainee, Univ. of Michigan

Assad Jarrah Zade, M.D., 772 Sherbrooke St., W., Montreal, Que., Canada

DECEASED MEMBERS

Lewis V. Carpenter, University Heights, N. Y., Elected Member 1932, Elected Fellow 1937

Clifford P. Fitch, D.V.M., St. Paul, Minn., Elected Member 1915

Frederick G. Metzger, M.D., Carthage, N. Y., Elected Member 1919

Samuel J. Stewart, M.D., Alhambra, Calif., Elected Member 1925, Elected Fellow 1932

DR. BENJAMIN G. HORNING TO JOIN STAFF OF A.P.H.A.

BENJAMIN G. HORNING, M.D., M.P.H., who for the last four years has been Health Officer of the City of Hartford, Conn., has resigned, as of July 15, to join the staff of the American Public Health Association as Associate Field Director, under the Committee on Administrative Practice. Dr. Horning's responsibility will primarily be in connection with the City and Rural Health Conservation Contests for 1940.

Dr. Horning, who is a graduate of the Harvard Medical School, class of 1928, and of the Johns Hopkins School of Hygiene and Public Health, was formerly connected with the Connecticut State Department of Health as epidemiologist and in charge of local health administration.

CLOSING DATE FOR SUBMITTING FELLOWSHIP APPLICATIONS

MEMBERS who may be interested in applying for Fellowship in the A.P.H.A. are hereby advised that Fellowship applications should be received not later than August 1, to insure consideration at the 69th Annual Meeting.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

The Association welcomes inquiries with regard to persons qualified, especially in the following classifications:

Administrative health officers
Epidemiologists
Public health educators
Maternal and child health physicians
Industrial hygienists
Laboratory directors

Positions Wanted

ADMINISTRATIVE

Physician, with Dr.P.H. degree, who has had 6 years' experience as public health administrator, seeks administrative position in full-time city or city-county health department. **A367**

Physician, M.P.H., Harvard; well experienced in city and rural health administration, will consider appointment as district health officer or in city or state health department. **A418**

A position in epidemiology or administrative public health is desired by physician with C.P.H. from Johns Hopkins, 11 years' administrative public health experience and excellent background of communicable disease control and school health service. **A368**

Position in administrative public health, maternity, infancy and child health, or health education desired by physician with C.P.H. from Johns Hopkins, who has had experience in these fields. **A343**

Well qualified physician, with M.P.H. from Johns Hopkins, and experienced as county health officer and now assistant health officer in a large city, will consider county or city administrative position. **A383**

Physician, M.D., Yale; M.S.P.H., Columbia; also short course for Health Officers, Vanderbilt; good clinical background; 3 years' public health experience; will consider appointment in child health, epidemiology, or public health administration. **A350**

Experienced physician who has been local health officer and school physician in New York State, several months' experience as acting city health officer, with M.P.H. from Harvard School of Public Health, wishes position in administration, epidemiology, or public medical service. **A423**

Physician, M.P.H., Johns Hopkins, experienced in district health administration, will consider position as county health officer or in state or city health department. **A458**

HEALTH EDUCATION

Position as health coördinator desired by young woman, experienced teacher in health education, with M.S. from the University of Michigan. **H398**

Experienced teacher in public health and author; M.A., Columbia; experienced in teaching public health nursing and carrying field promotion, wishes broad opportunity to train field personnel in extending knowledge and interest to the general public, especially through group education, institutes, exhibits, and rural programs. **H400**

Young woman, Ph.D., Columbia University, splendid background of experience in health education, will consider position as director of public health education. **H294**

LABORATORY

Experienced bacteriologist, young man of 33, Sc.B., who for several years has been in charge of state laboratory doing public health and diagnostic bacteriology, immunology, and serology, will consider opening. **L427**

Physician, C.P.H., Harvard-Technology; experienced as bacteriologist and pathologist and director of state laboratories, desires position. **L208**

SANITARY ENGINEERING

Public health engineer, B.S. in Civil and Sanitary Engineering; C.P.H., University of North Carolina; 3 years' experience with state department of health as field

supervisor during which time he was in charge of shellfish sanitation; also experienced as district sanitarian; seeks position in public health engineering field. **E430**

Engineer with good training and experience in water treatment, sewage plant operation and in research, wishes position as superintendent. Can go anywhere. **E422**

ADVERTISEMENT

Opportunities Available

DIRECTOR OF HEALTH EDUCATION—Public health nurse with college degree; must be experienced in educational work; $1,620, plus car allowance, increasing annually until maximum of $2,100 is reached; 41 hour week; duties will deal exclusively with tuberculosis program. PH-70, Medical Bureau, Palmolive Building, Chicago.

INSTRUCTOR IN PUBLIC HEALTH NURSING—For outpatient department large hospital having university affiliation; will carry courtesy appointment as instructor on university faculty also; B.S. degree and public health certificate required; $2,000, maintenance. PH-71, Medical Bureau, Palmolive Building, Chicago.

OUTPATIENT DEPARTMENT DIRECTOR — Graduate nurse with college degree and postgraduate training public health; department averages 200 patients daily; minimum 2 years' outpatient department experience in some position of responsibility; 44 hour week; $175, partial maintenance; California. PH–72, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH SUPERVISOR—Long-established municipal public health nursing association; heavy bedside nursing program; city of 50,000. PH–73, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSES—Two; for county health department; must have public health certificates; $1,800 plus $600 travel allowance; southwest. PH–74, Medical Bureau, Palmolive Building, Chicago.

VISITING NURSE—Duties will combine calls for large insurance company with care of children in day nursery; recent graduate from approved public health course eligible; private office, car and its maintenance furnished; $125; midwest. PH-75, Medical Bureau, Palmolive Building, Chicago.

SCHOOL NURSE—Fairly large town, northern Wisconsin; duties begin August 15. PH–76, Medical Bureau, Palmolive Building, Chicago.

SCHOOL NURSE—Public health training must be supplemented by excellent academic background; $135; Michigan. PH–77, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH PHYSICIAN—To assist director of municipal syphilis control program; eastern metropolis. PH–78, Medical Bureau, Palmolive Building, Chicago.

SCHOOL PHYSICIAN—Permanent appointment in vicinity nation's capital; $3,600, increasing; man around 35 preferred. PH–79, Medical Bureau, Palmolive Building, Chicago.

COUNTY HEALTH OFFICERS—Young men desiring public health training; experience not required. PH–710, Medical Bureau, Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIAN — Resident appointment in exclusive school for young women; should be well qualified in internal medicine; preference for man or woman with Ph.D. in addition to M.D.; midsouth. PH–711, Medical Bureau, Palmolive Building, Chicago.

SCHOOL PHYSICIAN—School for boys; New England. PH–712, Medical Bureau, Palmolive Building, Chicago.

Situations Wanted

BACTERIOLOGIST—B.S., M.A., Ph.D., large university; splendid experience in teaching and research; 8 years, serologist, large hospital, metropolitan area; for further information please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH PHYSICIAN—Received public health training, University of Michigan; active in public health work since 1935; especially interested child hygiene; under 40; Protestant; for further information please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Has just received B.S. in nursing education, following completion 5 year university course; public health training included 90 hours' field work; owns car; immediately available; for further information please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

NEWS FROM THE FIELD

FOUNDATION FOR THE STUDY OF NEOPLASTIC DISEASES

ESTABLISHMENT of a foundation for the study of the treatment of cancer will make the University of Pennsylvania an important center for the collection and utilization of vitally needed information in this field. It will be known as the Foundation for the Study of Neoplastic Diseases, and will be supported by The Penn Mutual Life Insurance Company for a period of 5 years.

The Foundation will be under the immediate direction of Dr. John S. Lockwood, who will have the coöperation of all chiefs of service in the University Hospital.

OKLAHOMA HEALTH DEPARTMENT TO OPEN LIBRARY

THE State Health Department of Oklahoma will open a library in its offices in Oklahoma City with material available to public health workers and private physicians.

Information will be furnished to physicians on request on prevalence and trends in diseases, and books on public health will be made available to health workers in units throughout the state.

PERIODICAL SERVICE FOR RURAL PHYSICIANS IN CALIFORNIA

THE regents of the University of California have authorized an increase in the budget of the university's Medical Center Library in San Francisco, to maintain a circulating periodical service for rural physicians throughout the state.

The costs of this service will be for mailing only.

DO LANDFILLS ENDANGER THE PUBLIC HEALTH OR SAFETY?

WITH slight but important reservations, the answer is " no " according to a preliminary report of the board of experts appointed to investigate five landfills maintained in the Borough of Queens, New York.

In the opinion of this group, " there are no conditions presently obtaining at the five landfills which endanger the public health or safety." The board is " convinced that certain potential health hazards obtaining previously at the sites of these fills have been diminished." With respect to the future, it concludes that " there are no conditions presently obtaining at the five landfills which may endanger the public health or safety in the future so long as sound sanitary practice is continued."

The procedure used in the operation of New York City landfills and the events leading up to the controversies over the practice is discussed in *Health News* (New York State), July 24, 1939. Adoption by the city of the landfill as the most economical method of disposing of garbage and refuse gave rise to strenuous objections from persons who resided in the vicinity of the landfill operations.

Residents charged that such landfills created offensive nuisances and endangered their health and safety. The city Department of Sanitation contended that the methods it used assured against the creation of nuisances or conditions prejudicial to health and safety and that the landfill method made possible the reclamation of waste lands and the creation of valuable property for parks and other purposes. For several months the battle between resident groups in

Queens and the city of New York over the "landfill" issue continued, resulting finally in the indictment of William F. Carey, commissioner of the Department of Sanitation, and Dr. John L. Rice, commissioner of health.

When the case came to trial before Justice Wasservogel of the Bronx Supreme Court, counsel for the plaintiff and defendants agreed on a stipulation that the question as to whether such landfills constituted a danger to the public health or safety be decided by a board of experts to be designated by Dr. Thomas Parran, Surgeon General of the United States Public Health Service. Such a board was appointed subsequently and has carried on studies and investigations over a period of several months.

It is composed of Drs. M. J. Rosenau, E. L. Bishop, Huntington Williams, Kenneth F. Maxcy and Mr. R. E. Tarbett, all outstanding experts in the field of public health.

Although in its preliminary report the board concurred unanimously in the above mentioned conclusions, it saw fit to include 16 specific recommendations in regard to procedures which should be followed in the operation of landfills, 4 of which follows:

1. The disposal of wastes by the landfill method should be planned as an engineering project. Operation and maintenance should be under the direction of a sanitary engineer.

14. Inspection and control of rodents should be maintained until the fills are stabilized.

15. After the active period of filling operation is completed, a maintenance program should be continued until the fill has become stabilized so as to insure prompt repair of cracks, depressions and erosion of the surface and side slopes.

16. Studies of the varied problems involved in landfill operations should be continued and should include researches into the biological, chemical and physical activities, as well as the engineering, economic and administrative aspects of the subject.

Other recommendations were related to such matters as maintaining narrow working faces on such fills, prompt covering of exposed surfaces with earth to make a closed cell of each day's deposit, incorporation of waste building materials and other bulky refuse in the body rather than the surface of the fills, final covering of surface and side slopes with earth to a depth of 24 inches, termination of boundary side slopes in a sand and gravel-filled ditch, spraying to allay dust, restricting the compacted refuse layers to a depth of about 8 feet, use of snow fencing to control blowing of papers, maintenance of water under pressure for fire fighting purposes, measures to prevent mosquito breeding, allay disagreeable odors, and to prevent floatage of waste material in adjacent open waters.

It is presumed that a final report will be submitted by the board at some later date. — *Health News*, Albany, N. Y., 17, 19 (May 6), 1940.

PHILIP P. JACOBS, PH.D.

WITH the death of Philip P. Jacobs, at the age of 61, the National Tuberculosis Association loses a competent and faithful member of its staff, on which he had served since 1908, being, in point of service, the oldest. For a number of years he has been Director of Personnel Training and Publications of that Association.

Beginning in 1904 as a newspaper man in Binghamton, he soon deserted that field and, in 1910, obtained a Ph.D. degree from Columbia University, having majored in Sociology. He joined the staff of the National Tuberculosis Association as Assistant Secretary in 1908 and, since 1916, has conducted institutes in many parts of the country particularly for training workers in tuberculosis prevention.

He was the author of *The Campaign Against Tuberculosis in the United States*, *The Tuberculosis Workers*, and *The Control of Tuberculosis in the*

United States. He has been a member of the American Public Health Association since 1912 and was a Charter Fellow.

He leaves a place which will be hard to fill.

ARIZONA PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

AT its recent annual meeting, the Arizona Public Health Association elected the following officers, to serve for the current year:

President—H. D. Ketcherside, M.D., Phoenix
President-elect—R. A. Greene, Ph.D., Tucson
First Vice-President—Dr. McMahon
Second Vice-President—Mrs. Caroline Krell, Douglas

GEORGIA PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

AT its recent annual meeting, held in Atlanta, May 23–25, the Georgia Public Health Association elected the following officers:

President—Dr. J. R. Evans, Stone Mountain
Vice-President—Mrs. Eudelle Trawick, Sparta
Secretary-Treasurer—D. C. Fowler, Atlanta
Chairman of Commissioners of Health Section—Dr. H. T. Adkins, Americus
Chairman of Nursing Section—Mrs. Lessie Cather, Atlanta
Chairman of Engineering Section—R. S. Howard, Jr., Macon

PENNSYLVANIA PUBLIC HEALTH ASSOCIATION MEETING

AT its meeting in Philadelphia, on May 23, the Pennsylvania Public Health Association made two awards for meritorious achievement in the field of public health. The recipients were: Arthur M. Dewess, Executive Secretary of the Pennsylvania Tuberculosis Society, and Dr. Henry Field Smyth, Sr., Professor of Industrial Hygiene at the University of Pennsylvania. The presentation was made by Dr. John J. Shaw, State Secretary of Health.

The citation to Mr. Dewees was in recognition of his public service through his work in the field of tuberculosis control.

Dr. Smyth's recognition was for distinguished public service through his studies and other contributions to the field of industrial hygiene.

New officers for the society were elected as follows:

Honorary President—John J. Shaw, M.D., Harrisburg
President—Harold H. Keller, Philadelphia
President-elect—Paul A. Keeney, M.D., Harrisburg
Vice-President—Harry B. Meller, Pittsburgh
Secretary-Treasurer—C. E. Houston, Washington

OHIO FEDERATION OF PUBLIC HEALTH OFFICIALS ELECTS OFFICERS

THE following officers were elected by the Ohio Federation of Public Health Officials at its recent annual meeting:

President—E. H. Schoenling, M.D., Cincinnati
President-Elect—P. L. Harris, M.D., Ravenna
Secretary-Treasurer—W. D. Bishop, M.D., Greenville
Representative on A.P.H.A. Governing Council—G. D. Lummis, M.D., Middletown
Alternate Representative—M. C. Hanson, M.D., Toledo

SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

THE following officers were elected by the South Carolina Public Health Association, at its annual meeting in May:

President—G. E. McDaniel, M.D., Columbia
President-elect—A. W. Humphries, M.D., Camden
1st Vice-President — Hilla Sheriff, M.D., Columbia
2nd Vice-President—E. T. Ammons, Spartanburg
Secretary-Treasurer—Mrs. Frank George, R.N., Columbia

PUBLIC HEALTH ENGINEERING COURSES AT THE UNIVERSITY OF ALABAMA

THE University of Alabama will inaugurate an expanded program of training in sanitary and public health

engineering in the fall of 1940 with the establishment of two new undergraduate curricula. Under the College of Engineering, there has been set up, following a recommendation of the State Educational Survey Commission, the William Crawford Gorgas School of Public Health and Sanitation, offering instruction in sanitary engineering and in public health and safety engineering.

The school is named after the late General William Crawford Gorgas, Surgeon General of the U. S. Army, whose pioneering work in sanitation and public health is well known, and whose father, General Josiah Gorgas, served as president of the University of Alabama and as professor of civil engineering.

The courses are under the general supervision of Professor George J. Davis, Jr., Dean of the College of Engineering, and of Assistant Professor Gilbert H. Dunstan and Associate Professor James M. Faircloth.

NEW EDUCATIONAL FILMS FOR FOOD HANDLERS

TWO new educational films illustrating approved dish washing and sanitization methods were announced in June as available to health departments undertaking programs of instruction for food handlers in public eating and drinking places.

Eating Out—a 16 mm. two-reel silent movie—was produced for the Flint, Mich., Department of Public Health under the supervision of H. S. Adams, Division of Food and Sanitation. The National Tuberculosis Association cooperated in the production and sent Dr. Adolph Nichtenhauser to direct the film. Inquiries for further information should be addressed to H. S. Adams at the Department of Public Health in Flint, Mich.

In Your Hands—a sound slide-film—emphasizes approved methods of dishwashing and the use of single-service paper untensils especially during rush hours. With the active collaboration of 11 city and state health officials and educators, the film was produced for *Health Officers News Digest*, Room 924, 30 Rockefeller Plaza, New York, N. Y., to whom requests for information should be addressed.

CANNED MOTHER'S MILK PROCESS IS ANNOUNCED

A NEW scientific process that will make it possible to seal mother's milk in cans and sell it in retail stores like commercial condensed milk was described by a speaker at the National Biennial Nursing Convention, held at Philadelphia, Pa., May 11–18.

The Maternity Center Association, of New York, predicted that the process would save the lives of hundreds of prematurely born infants.

It is stated that milk bureaus in New York, Boston, and other cities are distributing mother's milk in jars or frozen in cake form.

PERSONALS

Central States

DR. PAUL P. BAILEY, of Fort Wayne, Ind., has been appointed Health Officer of Allen County, succeeding DR. NOAH A. ROCKEY.

FLOYD C. BEELMAN, M.D.,† of Wichita, Kans., for 3 years Health Officer of Sedgwick County, has accepted the position of Director of the Division of Tuberculosis Control of the Kansas State Board of Health.

DR. NEAL D. CARTER, of Columbus, Ohio, has been appointed head of the Adult Hygiene Division of the Ohio State Health Department.

DR. CLARE GATES, DR.P.H.,* formerly Director of Health Education, of the North Dakota State Department of Health, Bismarck, N. D., resigned to assume the position of Regional Public Health Consultant for Region VII

* Fellow A.P.H.A.
† Member A.P.H.A.

of the Works Projects Administration, with offices at St. Paul, Minn., as of April 1.

DR. CLAUDE D. GREENE, of Spencer, Ind., was recently named Health Officer of Owen County, succeeding DR. BOAZ YOCUM, of Coal City, who held the position for 10 years.

DR. OSCAR S. HELLER, of Greenfield, Ind., has been appointed Health Officer of Hancock County, succeeding the late DR. JAMES B. ELLINGWOOD, of Fortville. Dr. Heller formerly held the position.

PAUL H. JESERICH, D.D.S., of Ann Arbor, Mich., has been appointed a member of the Michigan State Council of Health, for the term ending June 30, 1945, succeeding CARLETON DEAN, M.D., C.P.H.,* of Charlevoix, who resigned recently to become Deputy State Health Commissioner. Dr. Jeserich is President of the Michigan State Dental Society, and Director of Postgraduate Education at the University of Michigan School of Dentistry.

JAMES M. MATHER, M.D., D.P.H.,† of the Branch County Health Department, Coldwater, Mich., has been appointed Lecturer in Epidemiology and Biometrics, at the School of Hygiene, in the University of Toronto, Toronto, Ont., Can., effective July 1.

DR. WALTER M. MCGAUGHEY, of Greencastle, Ind., has been appointed Health Officer of Putnam County, to fill the unexpired term of DR. WILLIAM M. O'BRIEN, resigned, whose term was to have ended December 31, 1941.

DR. PERRY J. MELNICK, of Chicago, Ill., has been appointed as Pathologist to supervise a diagnostic service, of the recently established Division of Cancer Control of the Illinois State Department of Health, in Chicago.

DR. ARLINGTON J. RAWERS, of Mendon, Ohio, has been appointed Health Officer of Mercer County, to succeed the late DR. FRANK E. AYERS, of Celina.

DR. CHARLES E. STEWART, Director of the Battle Creek Sanitarium, Battle Creek, Mich., has announced he will retire at the end of the year. Until then he will serve as adviser to DR. JOHN E. GORRELL, who was appointed Administrator at the Sanitarium in October, 1939. Dr. Stewart joined the staff in 1895.

ELDRED V. THIEHOFF, M.D.,* Director of District Health Department No. 7, with headquarters at Gladwin, Mich., was appointed Assistant Director of the Bureau of Local Health Services, of the Michigan State Health Department, effective April 1.

Eastern States

J. LEON BLUMENTHAL, M.D., DR.P.H.,* of the New York City Department of Health, has submitted his request for retirement to the Board of Health. He served continuously during the past 35 years in various services of the Department of Health connected with child care, and has held the post of Director of Child Hygiene since 1924.

RAYMOND V. BROKAW, M.D.,* of New York, N. Y., has been appointed Chief of the Division of Cancer Control which has been established in the Illinois State Department of Health, with offices in Chicago.

LEROY U. GARDNER, M.D.,† of Saranac Lake, N. Y., Director of the Saranac Laboratory for the Study of Tuberculosis of the Edward L. Trudeau Foundation, received the annual William S. Knudsen Award for the most outstanding achievement in industrial medicine, for the advances in the knowledge of silicosis resulting from his research during the last 11 years.

DR. ELLIOTT P. JOSLIN, of Boston, Mass., has been named Honorary

* Fellow A.P.H.A.
† Member A.P.H.A.

Chairman of the Division of Medicine and Public Health of the Committee on University Development, Yale University, New Haven, Conn.

DR. HAROLD E. LONGSDORF, of Mount Holly, N. J., recently received a citizenship award for "meritorious service in the field of public health," presented by the Mount Holly Service Club.

JOHN J. SHAW, M.D.,† of Harrisburg, Pa., Secretary of the Pennsylvania State Department of Health, has been awarded the Dr. I. P. Strittmatter gold medal of the Philadelphia County Medical Society, in recognition of his work in organizing and correlating the health agencies of the state. The award is given annually for distinguished service in the interests of humanity redounding to the credit of the medical profession. Dr. Shaw is the only public official to receive the award since its first bestowal upon the late Dr. William W. Keen in 1923.

Southern States

EDWIN CAMERON, M.D., C.M., C.P.H.,† of Washington, D. C., Director of the Monongalia County Health Department and West Virginia Public Health Training Center, has been appointed Executive Secretary of the State Board of Health of Delaware, as of July 1.

T. E. CATO, M.D.,† Health Officer of Charleston, W. Va., has taken over the Dade County Health Department at Miami, Fla.

WALLACE M. CHAPMAN, M.D.,† of Harrodsburg, Ky., has been appointed Health Officer of District Health Department No. 3, including the Counties of Antrim, Charlevoix, Emmet, and Otsego, Mich., succeeding CARLETON DEAN, M.D., C.P.H.,* of Lansing.

JOHN D. FAULKNER, B.S.,† of Raleigh, N. C., was transferred from the position of Assistant Engineer, Division of Sanitary Engineering, North Carolina State Board of Health, to the position of Consultant Engineer, Endemic Typhus Control, Division of Epidemiology, State Board of Health, effective April 1.

DR. LUDVIG HEKTOEN, eminent pathologist, Executive Director of the National Advisory Cancer Council of the U. S. Public Health Service, Washington, D. C., Professor and Chairman Emeritus of the Department of Pathology of the University of Chicago, and Director of the John McCormick Institute for Infectious Diseases, has been awarded the honorary degree of Doctor of Science by the University of Chicago.

DR. WALTER B. JOHNSON,† of Cumberland, Md., has been appointed Health Officer of Caroline County, with headquarters at Denton.

JAMES H. LEVAN, C.E.,† of Brownsville, Tex., has been transferred to the U. S. Quarantine Station, Miami Beach, Fla.

DR. ADOLPH MEYER, of Baltimore, Md., has been elected President of the National Committee for Mental Hygiene. He succeeds DR. ARTHUR H. RUGGLES, of Providence, R. I.

DR. ALFRED C. MOORE was recently appointed full-time Medical Health Officer in the Baltimore, Md., Health Department.

THOMAS PARRAN, M.D.,* Surgeon General of the U. S. Public Health Service, was vested with the Order of Carlos Finlay by the Republic of Cuba, and with the Order of Aesculapius by the Medical Society of Colombia, during the recent sessions of the American Scientific Congress in Washington, D. C. The University of Maryland has conferred upon Dr. Parran the degree of Doctor of Science, St. Bonaventure

* Fellow A.P.H.A.
† Member A.P.H.A.

College the degree of Doctor of Laws, and Tufts College the degree of Doctor of Science, at recent commencements.

LEWIS C. SPENCER, M.D.,† of Harrisburg, has been appointed Director of the Vermilion Parish Health Unit, with headquarters in Abbeville, La., succeeding DR. MURPHY M. SIMS, resigned. The unit was in charge of DR. JAMES A. COLEMAN, of New Orleans, pending the appointment of Dr. Spencer.

DR. STUART P. VANDIVIERE, of Milledgeville, Ga., has resigned as Health Commissioner of Americus-Sumter County, to accept an assignment for duty with the U. S. Army air corps at Maxwell Field, Ala. DR. HENRY T. ADKINS, of Cochran, Ga., has been appointed to succeed him in Americus-Sumter County.

Western States

CECIL R. FARGHER, M.D.,† of Wenatchee, Wash., recently Health Officer of Chelan County, has been appointed Health Officer of Clark County, succeeding JOHN A. KAHL, M.D.,† of Vancouver.

J. C. GEIGER, M.D.,* Director of Public Health of the City and County of San Francisco, Calif., was granted a leave of absence of 8 weeks for a public health mission to the Orient, and sailed June 8.

JACQUES P. GRAY, M.D., M.P.H.,* has resigned from the faculty of the University of California, Berkeley, Calif., to become Health Officer of Hillsdale County, Mich.

DR. WILLIAM A. JOHNSON, formerly of Tacoma, Wash., has been appointed Health Officer in Cowlitz County.

DR. GEORGE R. KINGSTON, of Walla Walla, Wash., recently Health Officer in Walla Walla County, has been appointed Health Officer in Chelan County; DR. HAROLD M. U'REN, of Spokane, succeeded him in Walla Walla.

FREDERICK P. PERKINS, M.D.,† of Phoenix, Ariz., has been appointed Secretary and State Superintendent of Public Health of Arizona, to succeed COIT I. HUGHES, M.D.,† who is retiring.

Canada

THE HONORABLE HENRI GROULX, of Montreal, Que., a pharmacist and a member of the Provincial Legislature, has been appointed Provincial Secretary and Minister of Health for Quebec.

DR. JOHN C. MACKENZIE, General Superintendent of the Montreal General Hospital, has been appointed Officer in Charge of all Hospital Administration to the Canadian forces in England.

DEATHS

DR. W. B. ACKER, Health Officer of Hannibal, Oswego County, N. Y., died recently.

DR. E. E. EDDY, of Redwood, Jefferson County, N. Y., died recently. He was Health Officer of the town of Alexandria 1896–1898, 1903–1908, and 1919–1940, and of the village of Alexandria Bay 1921–1935.

FRED M. HOUGHTALING, M.D.,† of Sandusky, Ohio, Health Commissioner of the combined Sandusky City and Erie County Health District, died April 17.

PHILIP P. JACOBS, PH.D.,* Director of Publications and Extension, of the National Tuberculosis Association, New York, N. Y., died June 12, at the age of 61.

DR. LOUIS WHEELER, Health Officer of Tully, Onondaga County, N. Y., died recently.

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Association of Public Health Dentists. Cleveland, Ohio. September 8–9.

American Dental Association. Cleveland, Ohio. September 9–13.

American Dietetic Association — 23rd Annual Convention. Pennsylvania Hotel, New York, N. Y. October 21–24.

American Hospital Association. Boston, Mass. September 16–20.

American Public Health Association —69th Annual Meeting. Book-Cadillac Hotel, Statler Hotel, Detroit, Mich. October 8–11.

American Society of Civil Engineers. Summer Meeting. Denver, Colo. July 24–26.

American Society of Planning Officials. National Conference on Planning, in coöperation with American Institute of Planners, American Planning and Civic Association, and National Economic and Social Planning Association. San Francisco, Calif. July 8–11.

American Water Works Association.

Michigan Section — University of Michigan Union, Ann Arbor, Mich. September 11–13.

Rocky Mountain Section — Cosmopolitan Hotel, Denver, Colo. September 16–17.

Western Pennsylvania Section — Castleton Hotel, New Castle, Pa. September 18–20.

Southwest Section — Mayo Hotel, Tulsa, Okla. October 14–17.

New Jersey Section — Atlantic City, N. J. October 18–19.

Kentucky-Tennessee Section — Lafayette Hotel, Lexington, Ky. October 21–23.

California Section—Los Angeles Biltmore Hotel, Los Angeles, Calif. October 23–26.

Minnesota Section—St. Paul Hotel, St. Paul, Minn. November 7–8.

Association of American Medical Colleges. Ann Arbor, Mich. October 28–30.

Canadian Public Health Association—29th Annual Meeting. Winnipeg, Man. September 23–28.

Dairy Industries Supply Association. Atlantic City, N. J. October 21–26.

Federation of Sewage Works Associations—First Annual Convention, in conjunction with the 1940 Annual Meeting of the Central States Sewage Works Association. Hotel Sherman, Chicago, Ill. October 3–5.

Florida Public Health Association. Tampa, Fla. December.

Indiana State Medical Association. French Lick Springs Hotel, French Lick, Ind. October 29–31.

Institute on Maternal and Infant Hygiene—for registered nurses. University of California, Berkeley, Calif. July 1–20.

Institute on Science and the Nation's Food. Wellesley College, Wellesley, Mass. October 24–26.

International Association of Milk Sanitarians. Joint Meeting with the New York State Association of Dairy and Milk Inspectors. Hotel Pennsylvania, New York, N. Y. October 17–19.

Interstate Post-Graduate Medical Assembly. Cleveland, Ohio. October 13–19.

Michigan Public Health Association. Detroit, Mich. October 8–11.

National Association of Coroners. Hotel Adelphia, Philadelphia, Pa. August 26–28.

National Chemical Exposition—sponsored by the Chicago Section of the American Chemical Society. Stevens Hotel, Chicago, Ill. December 11–15.

National Recreation Congress—25th. Statler Hotel, Cleveland, Ohio. September 30–October 4.

National Restaurant Association. Chicago, Ill. October 7–11.

National Safety Council. Chicago, Ill. October 7–11.

New England Conference on Tomorrow's Children. Under the auspices of the Harvard University Summer School, and the National Conference on Family Relations. Littauer Centre, Harvard University, Cambridge, Mass. July 24–26.

New Jersey Health and Sanitary Association, Inc. 66th Annual Meeting. Hotel Berkeley-Carteret, Asbury Park, N. J. November 15–16.

Pacific Northwest Medical Association. Spokane, Wash. July 10–13.

Pan-American Congress of Ophthalmology. Hotel Cleveland, Cleveland, Ohio. October 11–12.

School Health Education Conference. Sponsored by the California State Departments of Education and Public Health. University of California, Berkeley, Calif. July 22–25.

Schoolmen's Conference—on "Facing Youth Problems." New Jersey State Teachers College, Montclair, N. J. July 11–12.

Society of American Bacteriologists. St. Louis, Mo. December.

Texas Public Health Association. Fort Worth, Tex. September 30–October 2.

Tri-State Conference of Food and Health Officials. Pittsburgh, Pa. October.

Foreign

Pan American Congress of Tuberculosis—Fifth. Buenos Aires, and Cordoba, Argentina. October 13–17.

Best Sellers in the Book Service *for* June

Panum on Measles. A Translation from the Danish. P. L. Panum	$2.50
Virus and Rickettsial Diseases. With Special Consideration to their Public Health Significance. Harvard School of Public Health Symposium	6.50
Municipal and Rural Sanitation. 2d ed. Victor M. Ehlers and Ernest W. Steel	4.00
Military Preventive Medicine. 3d ed. Lt. Col. G. C. Dunham	2.50
Community Health Organization. 3d ed. Ira V. Hiscock	2.50
Industrial Hygiene. A. J. Lanza and Jacob A. Goldberg, Editors	8.50
Manual of Industrial Health Hazards. Joseph B. Ficklen	4.00
Manual of Public Health Nursing. 3d ed. National Organization for Public Health Nursing	2.50
Basic Principles of Healthful Housing. 2d ed. Committee on the Hygiene of Housing — American Public Health Association	.25
The Story of Human Birth. Alan F. Guttmacher	1.00

Order from the Book Service

American Public Health Association

50 West 50th Street **New York, N. Y.**